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ONR

OFFICE OF NAVAL RESEARCH
60 *Years*
1946 - 2006

The Office of Naval Research...

Celebrating 60 years of scientific research in support of U.S. Navy power and the preservation of our nation

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The Biomimetic Underwater Robot, Robolobster, at Northeastern University. Biomimetic robots are, in principle, relatively small, agile and relatively cheap, relying on electronic nervous systems, sensors and novel actuators. Most importantly, they can take advantage of capabilities proven in animals for dealing with real-world environments. U.S. Navy photograph by John F. Williams.

Save the date! The next Department of the Navy Information Management and Information Technology Conference is scheduled for Jan. 30 to Feb. 2, 2007, in San Diego, Calif.

No conference fee will be assessed, but registration is required. Register at http://customer.bcinow.com/donregistration.

The conference is open to all DON, government and support contractor attendees. The agenda is available on the DON CIO Web site at http://www.doncio.navy.mil. For more information phone (703) 602-6274.

Features

NAVY ERP

Editor's Notebook

In this issue we celebrate the 60th anniversary of the Office of Naval Research with a snapshot of the many advanced technologies naval research has made possible — and with interviews with some of the Navy's top science and technology innovators. Thanks to Chief of Naval Research Rear Adm. William Landay and the ONR staff for the opportunity to explore the intriguing topic of scientific research in support of the warfighter.

In late July, courtesy of U.S. Second Fleet and the USS Dwight D. Eisenhower (CVN 69), I had the time of my life covering Joint Task Force Exercise (JTFEX) 06-2 "Operation Bold Step." As a guest aboard the "Ike," two days just wasn't enough time to talk to the dedicated crew and hear about the Eisenhower's challenging mission.

Although I visited many fascinating operational areas on board, one of the most exciting was flight operations. Landing on the arresting gear and launching off the catapult on a carrier on-board delivery, or COD, is the best thrill ride I've ever had — so far. My dream now is to fly in an F/A-18 Super Hornet.

I've never been grimier or hotter — or had as much fun as those two days on the Eisenhower. Many thanks to Lt. Mike Kafka from Second Fleet public affairs office and the Eisenhower public affairs staff, particularly Lt. Jody Cornell and Photographer's Mates Karisha Walker and Scott Wojciechowski — and especially the officers and crew aboard the Eisenhower — you're amazing!

In September, we observed the Urban Resolve 2015 experiment conducted with advanced modeling and simulation technology, which tested new concepts and doctrine for the joint commander operating in the complex urban environment. It was a thought-provoking glimpse into joint experimentation. Urban Resolve is sponsored by U.S. Joint Forces Command located in Suffolk, Va.

Topping off September was a visit to the Space and Naval Warfare Systems Center Norfolk (SSCN) change of command ceremony. SSCN provides affordable business solutions to the fleet with a customer base that includes more than 500,000 Sailors and Marines aboard more than 2,500 operational and support sites around the globe.

You can read about the vital work being done in support of the warfighter from all these events in this issue of CHIPS.

Welcome new subscribers!

Sharon Anderson

Sept. 20, 2006, Urban Resolve 2015 Technical Support – Air Force Maj. "Mitch" Mitchell explains how the modeling and simulation tools are distributed to Urban Resolve participants.

Sept. 22, 2006 – SSCN Executive Director Ms. Patricia Fuller and former SSCN commanding officer Capt. David Pry at the SSCN change of command ceremony on board Norfolk Naval Station. Pry was relieved by Capt. Joseph Konicki. Photo by SSCN Deputy Director Fleet Support Mike Siedlecki.

July 21, 2006 – Aboard the USS Dwight D. Eisenhower (CVN 69) with members of the Eisenhower public affairs staff, Lt. Jody Cornell and Photographer's Mates Karisha Walker and Scott Wojciechowski. The Eisenhower was operating in the waters off the coast of Virginia to participate in Joint Task Force Exercise (JTFEX) 06-2 "Operation Bold Step." Photo courtesy of Mike Gallagher, Airshow Photography.

Reflecting on Change and People

A journey of transformation never ends. The value of continuous improvement efforts is that we remain ever vigilant to look for opportunities to improve efficiency and effectiveness, to drive out waste and variability in processes and to seek out meaningful organizational and process change. Information technology is crucial to our transformation, but we must never lose sight of the fact that IT is an "enabler" for warfighting/business transformation and merely inserting new technology is not enough.

The power of technology today is its ability to unite us, around the world, to share knowledge, reduce cycle time, increase quality and improve our ability to make well-informed and timely decisions. Implementing an automated solution in a vacuum is not the answer. The focus of our efforts must be to improve our processes and then leverage technology as a tool to accelerate and sustain the transformation.

Enterprise Resource Planning solutions only deliver their true potential if we take the hard steps of reviewing and changing our processes. A new personnel system will miss the mark if we don't make the effort to use the deployment of the system as a catalyst for change — to eliminate non-value added work, unnecessary steps and oversight, and antiquated processes.

The key to our success then, is not the technology, but rather our people. Each of you is the spark that can ignite dramatic improvements in the way we defend this great nation. As Information Management/Information Technology professionals, you are thrust into the forefront of change.

You are the community that first realized that today's complex problems cross organizational boundaries and the old models of personal control had to be cast aside if we were to truly achieve the benefit of moving away from sub-optimized local solutions to enterprise-wide naval and joint solutions. You are lightening rods for change; you carry the torch for this great organization and your commitment to being positive forces for change will create an exciting and powerful future.

You must support and encourage each other, as change management is never an easy task. Be undaunted, and don't let frustration or impatience overwhelm you, but rather let it be an engine to accelerate your efforts and strengthen your commitment. Peter Drucker, one of the great leadership minds of the 20th century, once said, "Management is about [people] … [making] their strengths effective and their weaknesses irrelevant."

I consider myself blessed to work with such an outstanding group of Sailors, Marines, civilians and contractors who, choosing careers of service and sacrifice, strive tirelessly to preserve our freedom and improve our capabilities. Each of you makes a difference. Each of you is crucial to our future. Lead by example; motivate by your personal commitment.

Remember what Larry Bossidy and Ram Charan said in their book, "Execution"— "Leaders get the behaviors they exhibit and tolerate."

Remember also what George Labovitz and Victor Rosansky said in their book, "The Power of Alignment" —"Whether it comes from the top, the middle or somewhere else, positive leadership and energy are required to move people to action."

And so I'll end this column the way I began my first column in this fine magazine. It is a time of change; it is a time of opportunity. Always remember that there is great power in working as a team, and there is unlimited potential in your creativity, imagination, perseverance and commitment. Thank you for all that you do in support of this great Navy-Marine Corps team.

Dave Wennergren

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Interview with Rear Admiral William E. Landay
Chief of Naval Research

Rear Adm. "Bill" Landay is the Chief of Naval Research and the Assistant Deputy Commandant of the Marine Corps for Science and Technology Director, Test and Evaluation and Technology Requirements.

The Office of Naval Research's mission is to: foster, plan, facilitate and transition scientific research in recognition of its paramount importance to enable future naval power and the preservation of national security. The ONR provides technical advice to the Commandant of the Marine Corps, Chief of Naval Operations and the Secretary of the Navy and works with industry to improve technology manufacturing processes.

Rear Adm. William E. Landay

With a budget of about $1.8 billion and additional funding of $400-$500 million from the Congress, the CNR, working with about a dozen top advisers, directs the strategy for naval science and technology research. Development of naval capabilities falls into the Department of Defense budget activities known as 6.2 and 6.3 funding: applied research and advanced technology development, respectively.

In talking with Rear Adm. Landay and his science advisers, the common thread is their thirst for "game-changing" technologies in all areas of research – weapons, sensors, ships, power and fuels, life sciences and more. CHIPS asked the "CNR" to discuss his thoughts on celebrating 60 years of naval research during the 2006 Naval S&T Partnership Conference August 2006.

CHIPS: Probably, one of the most intriguing aspects to the conference is the $1 million "CNR Challenge" for innovative science and technology ideas.

Rear Adm. Landay: We have had conferences in the past and tried to provide opportunities for folks to come to ONR with good ideas in areas that are of interest to us. What we found is that there were some good ideas, but we had trouble doing anything with them because we were in the middle of an execution year, and the budget is already set.

We thought about how we could encourage innovative thinking and use the flexibility of this conference to get folks to provide input in a way that would be of value to them. A lot of folks said they were not sure that it was worth coming with ideas when we could not do anything with them. So we carved out some dollars — this year's dollars. So if the ONR project officers believe there is a good idea that could be of real benefit, we have dollars set up to fund it.

It is an opportunity for our folks to have more flexibility. We set $1 million as a goal. We would like to be able to spend it all, but it depends on the ideas. It will not be $1 million per award. We are looking to fund a number of awards.

The thought is that if there are good ideas we can get them started and continue to develop them and bring them into our budgeting process — if we need to fund them more than the first year or two. We are excited because we have gotten a lot of good interest. We have had almost 100 submittals. It is more than we have gotten in the past because people see it as an opportunity.

This is one of our focuses — things that we can do to speed up our ability to find and start working on those good ideas, which in the past we have not been able to do.

CHIPS: Besides military utility, what are your criteria when you are reviewing these proposals?

Rear Adm. Landay: There are a number of things that we look at. Is it innovative? Is it in an area that we have not thought of before or allows us to approach a problem differently? In a lot of cases, we will be told by the operators, 'Here's what we need.' But they frequently will ask for our help with an answer in mind.

We tell them to tell us what their problem is and let us look at the opportunities. Sometimes we find completely different ways of approaching a problem that neither the operator nor our folks have thought of before.

We are also interested in ideas that not only solve one problem but potentially have opportunities to solve other issues. Ideas with multiple applications are of interest to us — things that may potentially open new avenues that we have not thought of before, that are not just innovative, but take us in a different direction.

We always look at the risks. We would like to find opportunities with reasonable risk, but sometimes we need to take some high risk (bets, if you will) because we see enormous payoffs. Sometimes someone will bring something to us and we are not sure how we would use it, but it could change the way we are thinking. The out-of-the-box approach to something is often worth making the relatively small science and technology investment to see if we can move it in a particular direction.

CHIPS: Are you going to make a decision during the conference?

Rear Adm. Landay: We asked people to give us a brief abstract. We have taken those and out of those that we thought looked promising, we have set up one-on-one sessions. The person who submitted the abstract will get a chance to sit down with one of our key project officers and talk about it.

Legally, we cannot say, 'Here's $100,000 and off we go.' We still have to go through our contracting process, but we want to give that department head or project officer the ability to say this idea is

"People would say that the problem with S&T is that you are always trying to focus on big global, change-the-world kinds of things, and you should, but there are a lot of things impacting Marines and Sailors that you should also focus on." – Rear Adm. "Bill" Landay

good, and we will fund it. Hopefully, in a short time, we are engaging with the researchers to sign the final contracts and put the conditions in place. What has always prevented the project officer from doing that is having a ready pot of money. What I have told them is that I have this pot of money, and if it is a good idea, you can spend out of it. The project officers are excited about that.

CHIPS: Is this the purpose of the conference?

Rear Adm. Landay: There are a couple of purposes for the conference. One is to keep a good discussion between ONR and industry in terms of what we are doing and what our strategies are and where we see the Navy going. It is informing industry, it is informing academia and the naval warfare centers, the Navy labs and other government labs.

It shows them what is important to us — as well as our strategic thinking as we go forward. It also gives them an opportunity to propose back to us. It is an information exchange. We think it is important because S&T is not always well understood. To periodically get together with all the key players and say, 'This is what we meant when we said the CNR challenge; this is what we meant when we said we were going into directed-energy weapons,' so that everybody walks away with a better understanding.

We wanted to do some displays this year. We have not done that in the past. The conference provides opportunities to display and exhibit some of the things ONR is talking about and provides opportunities to interact with other folks. It is important that the science and technology piece of this gets recognized, as well as the warfighting and people piece.

CHIPS: You mentioned Tech Solutions this morning, where Sailors and Marines can submit ideas that impact their readiness and quality of life. What kinds of ideas do you get from them – more of the nitty-gritty issues?

Rear Adm. Landay: It tends to be that way. People would say that the problem with S&T is that you are always trying to focus on big global, change-the-world kinds of things, and you should, but there are a lot of things impacting Marines and Sailors that you should also focus on. A lot of the Navy infrastructure is designed to work those issues. Sometimes there is not a solution to them.

We have realized that we have such a strong, vigorous S&T base that sometimes the answer already exists in a lab, but we were thinking of that answer for another problem. Tech Solutions is an opportunity to easily and quickly lift something we have and put it in a different application to support the Sailor.

In the last three years we have had about 150 requests come in. About 40 of those were not science and technology related. Of the 100 that were left, we have sent 74 solutions out to the fleet. It is about an $8 to $10 million a year budget, so it is not a huge investment of our dollars. It ranges from battle lanterns to a solution to make submarines on the surface more visible to radar to prevent collisions.

Submarines on the surface are hard to see. We were asked if there were some way to make a submarine on the surface more visible to radar by building a radar reflector that would be small, easy to use, easy to put up, and easy to take down in the submarine. There was not anything readily available, but we are good at radar and signature.

It came into Tech Solutions, and they turned something around and gave it back out to the submarine fleet — and they love it. We never thought about how we could use solutions and signatures to make something bigger …

CHIPS: The CNO has said that Sailors are going to be boots on the ground to relieve some of the stress on Army and Marine troops. Has this been a big focus change for naval research?

Rear Adm. Landay: It has not been a huge focus change. The reason I say that is that relieving Army and Marine folks from some duties did not require a lot of science and technology research. For example, we have folks in the Navy who run naval bases for us. We also have to run bases over in Iraq.

We have not made any big shifts in science and technology. The biggest one is probably the stand up of the Navy Expeditionary Combat Command or NECC. We are engaging with them in terms of how we might be able to support them.

CHIPS: Is the effort for the NECC focused on its riverine capability?

Rear Adm. Landay: They have the EOD (explosive ordnance disposal) mission, the riverine mission, their mission integrates all warfighting requirements for expeditionary combat and combat support elements.

Our efforts have been focused on the riverine, EOD and force protection. In many cases it has been things that we have been doing for the Marine Corps that seem to have reasonable applications to NECC.

A lot of our interaction initially was to show them the things that we can quickly transition to help in their mission. They are still new, less than a year old, so they have not made their first big deployment yet. We are trying to make sure that we are fully ready to support them in preparation for their initial deployments.

CHIPS: I was fascinated to find that ONR has funded nearly 60 Nobel Prize winners. What draws this caliber of scientist to naval research?

Rear Adm. Landay: To some extent it is a tribute to the people at ONR who are going after the best research and researchers and ideas we can find. The fact that we have that many of them is an

indication that we have been good at identifying critical areas that have significant potential — early.

To win the Nobel Prize, the potential tends to be much broader than just the Navy. It may be 15 or 20 years of research before the person gets recognized, and we just don't fund them in the last years. We have a good process where the research community is comfortable working with us. We like to give our researchers a lot of freedom.

We are hiring these folks or giving them grants for their intellectual capital to figure out how to move us forward. We try to give them a lot of flexibility and freedom. Sometimes things do not pan out, but that is OK.

The third piece of it is that we have frequently been able to show researchers, early in their research, where we see the naval application for that research. The big thing is that we have people who are good at understanding where good science and technology is being done, and they are aggressive about engaging those researchers.

We have been doing this for 60 years. I think there was a good model in the beginning for how you can engage with researchers and scientists without them feeling like the Navy is trying to turn them into Sailors.

They are proud that they work with ONR. I am amazed at the number of people I meet who say, 'ONR funded my first research.' Assistant Secretary of the Navy for Research, Development and Acquisition Dr. Delores Etter received her first research grant from ONR.

CHIPS: Was there anything that surprised you about ONR when you became the Chief of Naval Research?

Rear Adm. Landay: I always had a high regard for the ONR. The quality of the people did not surprise me. What did surprise me is the breadth and scope of the reach of ONR.

I am just amazed at the people that tell me of some association that they have with ONR. They were an investigator, or we funded some research through them, or they were part of an education program that ONR partially supported — that is both in the U.S. and outside of the U.S.

I have to admit that I always thought of ONR as inwardly U.S.-focused, primarily doing research at Navy labs and certain universities. But we are doing research at a lot more universities than I ever imagined both inside the U.S. and outside the U.S. ONR is doing work across the government and more work in industry than I thought. The scope and breadth of who our scientists engage with impressed me.

CHIPS: There has been some debate about the crisis in recruiting scientists and engineers for the naval labs and warfare centers, but some critics say that this has always been a problem.

Rear Adm. Landay: I think there is a challenge. I have not been able to decide for myself whether it is a crisis or not. When you look at who is going into science, technology and engineering in univer-

"I am anxious about the workforce. There is a lot of competition for scientists. Everybody I am trying to hire into the Naval Research Lab, IBM is trying to hire, GE is trying to hire or a university is trying to bring back as a researcher." – Rear Adm. "Bill" Landay

sities across the U.S., it is a broad mix. There are a lot of foreign nationals that come in.

But one of the challenges in our labs is, in most cases, we need those people to be U.S. citizens. Also, because a lot of money can be made in business, it is hard to bring folks into engineering curriculums and continue them through their master's and doctorate degrees. We need to continue to focus in that area.

In ONR, I am trying to rationalize what my role should be. Programs like N-STAR, Naval Research — Science and Technology for America's Readiness, provide an educational opportunity.

We are interested in the diversity of the workforce. We try to do a lot of work with historically black and minority institutions because we think they are an untapped resource. We go to universities that have up-and-coming engineering and science programs.

I put $1.6 billion worth of research money out on the street, so we try to link N-STAR programs to actual research we want to do. The way you recruit students is have them spend summer as an intern in their junior year of college at a Space and Naval Warfare Systems Center, for example.

During that summer internship, they are drawing a salary and are in the middle of some exciting work. They may look around and think, 'This is a great place to work.' They go back to the university, get their degree and when people are asking them to come work for them, they have a favorable impression of the Navy and DoD labs.

I am anxious about the workforce. There is a lot of competition for scientists. Everybody I am trying to hire into the Naval Research Lab, IBM is trying to hire, GE is trying to hire or a university is trying to bring back as a researcher.

There is a lot of competition for what appears to be a dwindling pool. We are trying to keep our pool of researchers robust and early on (just like any other company) trying to get people to say, 'There are some exciting things going on within the Navy research enterprise. I might not earn quite as much money, but the excitement of the research outweighs the benefits of working elsewhere.'

We do very well. Folks come back. They can do some great research in our labs and in our warfare centers.

Go to Navy NewsStand at http://www.navy.mil/navydata/bios/ navybio.asp?bioID=172 for Rear Adm. Landay's biography. For more information about the Office of Naval Research go to www.onr.navy. mil.   **CHIPS**

How to Hide a Ship

"Don't get detected. If detected, don't get targeted. If targeted, don't allow a mission kill. If a mission kill occurs, don't lose the ship."

By Nancy McGuire

In 1943, so the story of the Philadelphia Experiment goes, the U.S. Navy found a way to make a ship invisible. In reality, the Navy was conducting research on making ships magnetically "invisible." That is, the Navy was counteracting distortions in the Earth's magnetic field that a ship normally produces when it moves through the water. The Navy's goal was to prevent its ships from setting off magnetically-triggered explosive mines.

Recently, the Navy has tested emerging high-temperature superconductor (HTS) technology to develop a lighter, more compact, magnetic cloaking device to protect its ships from underwater explosive devices.

Since 1950, the U.S. Navy has lost more ships to mines than to missiles, torpedoes or bombs. To reduce this risk, some Navy ships are equipped with degaussing systems, basically a network of electrical cables that wraps the ship. The electrical current in the cables is calibrated to counteract the magnetic field fluctuations that the ship produces as it travels through the water. Thus, the ship is less likely to set off underwater mines or be detected by hostile forces.

Conventional copper-cable degaussing systems are effective, but they are also heavy, bulky and power-hungry. Although the new superconducting devices will offer no cost savings (at least in the early stages of acquisition), their light weight, compact size, and lower installation costs offer a net advantage aboard a ship. Further, the cost of an HTS system is expected to drop as the production capacity for HTS wire grows.

Because the HTS cables carry a much greater current density than copper, there is a potential 80 percent weight reduction over current copper-cable degaussing systems. For a ship such as the LPD 17-class amphibious transport dock ship, this could translate to a weight reduction of about 125 long tons.

The Office of Naval Research is sponsoring HTS degaussing research at the Naval Surface Warfare Center, Carderock Division, in Philadelphia. The Carderock researchers — Mike Gresco, Brian Fitzpatrick, Jacob Kephart and Michael Robinson — are assessing the feasibility of using this technology, identifying the risks involved, and coming up with the specifications that will make it possible for its use on Navy ships.

Their goal is to push the technology to a level of readiness that will allow the Navy to incorporate it into an acquisition program. The Carderock group has submitted four patent disclosures to date, with more to follow.

On June 8, the Carderock group sponsored an industry day. Representatives from various military contracting companies and manufacturers of superconducting materials got a look at the operational one-loop demonstrator system and took a virtual tour of the technical drawings for an upcoming two-loop system. The existing demonstration system, which uses commercially available components, has been operational since February. It uses gaseous helium to maintain the single 50-meter loop at an optimum operating temperature of about –220 C.

Despite a cooling problem that has been identified and will be addressed, the system has achieved 300 amp-turns of magnetic flux to date. After this problem is corrected, the system is expected to more closely approach the predicted flux of 1200 amp-turns.

The system has been built to accommodate additional superconducting wires that will bring the flux to the level required for an operational ship system. It uses the first-generation HTS material bismuth strontium calcium copper oxide because of its availability and price.

Future systems may use the second-generation yttrium barium copper oxide superconductors, which can operate at higher temperatures and reduce refrigeration requirements.

In April 2006, the American Superconductor Corp. announced that it had successfully demonstrated a full-scale HTS-based degaussing cable. Its laboratory setup uses a gaseous helium-cooled 40-meter bismuth calcium copper oxide HTS cable to produce 4100 amp-turns, a magnetic flux that is comparable to the existing copper-based degaussing cables used in military ships.

However, the HTS cables operated on 0.5 volts, compared with the 500 volts needed for copper degaussing coils. The HTS cable weighs about 20 percent less than conventional copper cables.

These factors combine to reduce the installed cost of the HTS degaussing system to about 40 percent compared with a similar copper coil system.

At present, the Carderock group is adding amp-turns to its system and checking the magnetic performance of the system, according to Fitzpatrick. The refrigeration system must be capable of maintaining the entire length of the cables at the proper temperatures, while withstanding the shocks and vibrations that are typical of a shipboard environment.

Nancy McGuire is with the Office of Naval Research public affairs office. CHIPS.

Project engineer Brian Fitzpatrick, from Advanced Machinery Technology Naval Surface Warfare Center, Carderock Division, with the framework for a new HTS two-loop system.

Interview with Dr. Starnes Walker
ONR Technical Director and Chief Scientist

Dr. Starnes Walker

Dr. Starnes E. Walker joined the Office of Naval Research in September 2004 and serves as the technical director and chief scientist, reporting directly to the Chief of Naval Research (CNR). Working with the CNR, Dr. Walker is responsible for the technical content, quality of content, and structuring a science and technology (S&T) investment program that ensures technological superiority for the Navy and Marine Corps.

Dr. Walker works with the university community, government laboratories, the military services, Office of the Secretary of Defense, and industry to bring their resources into the naval S&T program.

CHIPS asked Dr. Walker to talk about his work in August at the Naval S&T Partnership Conference.

CHIPS: How do you bring such diverse groups together to work toward one common goal?

Dr. Walker: My career started at the Naval Weapons Center at Corona Laboratories back in 1968, so I have a good understanding of naval S&T since my work started with weapons research and development (R&D) during the Vietnam War.

From those beginnings, I spent 26 years in industry, and then I returned to the Defense Department to help stand up the Defense Threat Reduction Agency as the head of science and technology. I was the senior adviser for S&T to the director of DTRA.

The universities and small businesses *(where a lot of creativity comes from)* come together with ONR in terms of discoveries, and ONR capitalizes or harnesses that S&T. We look at the S&T for naval applications and what is important for the Department of the Navy (DON) and our Sailors and Marines.

ONR's focus includes what S&T discoveries can be revolutionary and game-changing. How do we *insure* that ONR provides a leg up on the technology surprise to our warfighters?

Academia likes to help create that discovery, and we have 60 years of good experience on how to support the best and brightest people. ONR is very proud that 57 of our principal investigators across the academic institutions have won the Nobel Prize.

Our program officers and department heads are often Ph.D.s with 10 to 15 plus years experience before they come to ONR. They are well recognized either nationally or internationally in their fields. They know how to identify the best and brightest of people and how to best identify exciting areas of opportunity for discovery that would be of importance to the DON assuring

technology superiority and military capability for the fleet and force.

Having the S&T focus and talent at ONR harnesses the Naval Research Enterprise (NRE) as an engine for S&T discovery and exploitation. The NRE includes academia, industry, small business, our naval warfare centers, our military service partners, other government agencies, and our coalition partners together to catalyze S&T to empower the fleet and force.

We like to capture the S&T synergisms that are within government, in our national laboratories, and within ONR's corporate laboratory, the Naval Research Lab, as well as our University Applied Research Centers (UARCs). The Applied Research Lab at Penn State, the Applied Physics Lab at Johns Hopkins, the Applied Research Lab at the University of Texas, and the Applied Physics Lab at the University of Washington — are all Navy UARCs.

Each of our UARCs helps ONR in our outreach to academia. They do both classified and unclassified work. They understand how to conduct and harvest S&T that may have naval military application. The UARCs help us reach out across our naval warfare centers and they help us reach into industry, into application, and into programs of record.

ONR has evolved over the last 60 years from our beginnings as a basic research organization. We were the precursor to the National Science Foundation.

In 1951, *Scientific American* reported that the government was considering creating a National Science Foundation and that the template would be the Office of Naval Research because ONR was at that time the largest funding organization of basic science in the federal government, and our performance track record was exemplary.

Forty-two percent of our investment in basic research and early applied research can be found in thousands of grants with the global university community. We reach out to the entire world because we do not have a license for discovery just within the United States, and we need to be aware of important discoveries that occur outside our home borders.

CHIPS: Have we ever been surprised by something new?

Dr. Walker: Fortunately, we have stayed on top of S&T that could have strategic impact. One example is the work that Otto Hahn and Lise Meitner did in Germany. Their original scientific papers were noticed by Enrico Fermi and other U.S. scientists during World War II. Hahn and Meitner published papers that described what some interpreted as nuclear processes occurring within atoms.

Einstein's famous letter to President Roosevelt, with the support of Enrico Fermi, stated that the work by Hahn and Meitner could be far-reaching and of strategic importance to the world, a discovery that could be a new form of energy that we could harness that could also lead to a new class of weapon far surpassing anything that man had ever seen.

Discoveries occur and people do not know where it is going to lead. Many important discoveries are often serendipitous and orthogonal to where a scientist or engineer begins his research thrust. We need to be cognizant of that.

The United States has led science and technology for many years in many different fields, in collaboration with our European partners, the United Kingdom, Australia, Canada and India, for example. A lot of intellectual capability in the physical sciences and engineering has been found outside U.S. borders within the nations of the world. I am not so naive to believe that future discoveries will be limited to within our usual partners.

CHIPS: You have a diverse and impressive background in research in both government and industry including Argonne National Laboratory, Los Alamos National Laboratory, Idaho National Laboratory and Lawrence Livermore National Laboratory. What draws you to naval research and government service?

Dr. Walker: I owe a lot to the Navy. I was born into a Navy family. My dad was a Navy fighter pilot. In World War II, he flew the F4U Corsair as a carrier combat pilot. I was born at the Navy hospital in Portsmouth, Va., at the end of World War II.

My degrees are in physics. During the Vietnam War, I wanted to become a naval officer, like my dad, so I signed up for Officer Candidate School (OCS). I wanted to be either a pilot or a SEAL, but they both required perfect vision. So I decided to do whatever I could do best to serve my country and the Navy.

In parallel with that, I joined the Naval Weapons Center as a research physicist working on proximity fuses and later on guidance and warheads. My thinking was that I could continue to help support the Navy prior to my admission to OCS, which was not scheduled for many months. There was an eight-month wait.

During that time the admiral at the head of the Naval Weapons Center at China Lake convinced me that my career for the Navy might be better served if I continued working on weapons systems, air-to-air missiles and warhead development.

At that time the Naval Weapons Center was doing a lot of countermine work to address the ongoing threat in Vietnam. We were sending a lot of our folks to Vietnam as scientists and engineers so we could work side-by-side with our warfighters to figure out how to defeat the booby traps and mines that were killing them and affecting our riverine operations.

From this focus, the admiral advised me that if I stayed on as a civilian at the Naval Weapons Center, I could get a change of workweek and go to graduate school in physics and work full-time too. I took his offer and began full graduate school loads at the University of California and worked full-time.

Needless to say this schedule just about killed me, but then my department head told me about a Naval Fellowship Program to the University of California. He recommended that I compete for the fellowship. I took the exams and the oral boards, and I

was selected. My duty station became the University of California from the Naval Weapons Center, and I finished my doctorate in nuclear physics there.

The Navy helped me do all that.

When I first came aboard to DTRA, the director was Dr. Jay Davis. For the previous six years, I had been a science adviser to Lawrence Livermore National Laboratory, which is operated by the University of California for the U.S. Department of Energy. I came aboard as a member of the Senior Executive Service and served as the senior adviser for S&T at DTRA.

In this capacity I served as a member of the Defense Science and Technology Advisory Group with Dr. Hans Mark, Director Defense Research and Engineering (DDR&E) in the Office of the Secretary of Defense in 2000 and with Dr. Delores Etter, who was the deputy under secretary of Defense for S&T, under Dr. Mark.

I worked closely with Rear Adm. Paul Gaffney while he was the CNR from 1996 to 2000 and then with Rear Adm. Jay M. Cohen, when he came aboard as the CNR.

During this same period I was asked by DDR&E to serve as the technical program officer for the DoD to lead advanced energetics for the Department and to lead the thermobaric weapon development (BLU-118) and Hellfire II.

After the horrific 9/11 attacks on the United States, I worked closely with ONR with the outstanding help of Dr. Ed Liszka (Dr. Liszka was ONR's chief scientist and is now the director at ARL Penn State) and Dr. Spiro Lekoudis (an ONR department head), with the Naval Surface Warfare Center Indian Head Division and the U.K. Ministry of Defense, so that we could develop a thermobaric weapon in 90 days that we would then use to defeat our adversaries within the Afghanistan caves.

These great experiences and support with and from the Navy gave me the opportunity to tell Rear Adm. Cohen that it would be a pleasure to come back and be part of the DON team.

From my perspective, I wanted an opportunity to help the DON and to give back whatever I could best contribute in supporting our Sailors and Marines and to help build the capabilities of the fleet and force.

CHIPS: You mentioned the Nobel laureates that have been funded by ONR. What draws such a large distinguished group to national defense, particularly the Navy?

Dr. Walker: If you look at the history of the ONR and the foundation of the Naval Research Lab, NRL is ONR's corporate laboratory. The need for NRL was first conceived by Thomas Edison and other leaders about 1917 after the sinking of the Lusitania.

The United States realized that we were being surprised technologically with the capabilities of the German submarine force, and we needed a great laboratory for the U.S. to ensure that the U.S. always would have technology superiority.

"I want a 'Tricorder' for evil. I would like to be able to detect intent. You have to understand how a person is motivated. Why would he or she want to become a terrorist?"

– Dr. Starnes Walker

Thomas Edison and Vannevar Bush, with the support of the Navy Department, championed the creation of NRL with Congress. About 1920, construction on the site started and thus began the genesis of NRL. NRL has a history of attracting the brightest of scholars together for naval S&T.

I do not know the exact number of how many Society Fellows we have in all of the nation's professional societies, but I am sure it is hundreds. NRL has a Nobel laureate in chemistry, a Fields Medal winner, and nine National Academy members. For almost 90 years since its founding, NRL has been the residence of the best and brightest of scholars.

CHIPS: Do you have a particular area of research or project that you are most interested in?

Dr. Walker: From the DON standpoint, the things that intrigue me are enhancing our strike capability and as a subset, directed energy and the ability to reach out and hold at risk at the speed-of-light, or near speed-of-light, advanced weapon capability.

In the area of material science, if we can push the frontiers of science to achieve room temperature superconductors, that would be game-changing. The impact of room temperature superconductors would cut across many fields — from propulsion to motor generators, how we apply that to the production of electricity, how this would impact energy efficiency and magnetic energy storage. It would revolutionize our capability and touch many facets of society.

The area of energetics intrigues me. We have been working with the same chemistries for 40 or 50 years. What new mechanisms exist to store energy and release it rapidly? Can we develop areas of designer molecules and designer crystalline structures that can store significant amounts of energy? The area of energy and power is important. From a DON standpoint, without energy and power, we are literally and figuratively dead in the water.

Oil is now $75 a barrel. Where is it going to? Energy security is related to national security.

CHIPS: You have engaged the scientific community concerning the improvised explosive device problem. Is progress being made?

Dr. Walker: I believe we are making progress, but we have a along way to go. We are trying to save the lives of our warfighters, but the IED is also a threat to the nations and people of the world. Solutions to the IED threat are going to require us to move up the kill chain so that we can move miles and days spatially and temporally away from the 'boom' so that we can strike and de-

feat the terrorist and his IED before we are in harm's way. We need to work on the prediction side of the equation.

If we can achieve this, we can hold at risk the bomb maker and the people providing the ingredients and the funding and their will. Like the drug trade, the analogy is that you have to have seeds to grow, you have to harvest your product, you have to process, you have to package, you have to distribute, and you have to have the economics that support this infrastructure.

The solution is going to be interdisciplinary. Many discoveries in science are serendipitous. You start out in one direction, but the real discovery is after you see something that you do not understand. Then you move in another direction, an area that is most fertile, and that is where you make a game-changing discovery.

When you build an interdisciplinary community of the human behavioral, social and cultural sciences and religious studies, those scholars working with physical scientists and people that have not worked together sometimes spawns creativity.

When you bring principal investigators that have different fields of expertise, different views, and a different experience base, that is where the art of the possible happens.

CHIPS: I've read about studies that look at affecting a cultural change, so that the action would be so reprehensible that making or planting an IED would be unthinkable.

Dr. Walker: What makes terrorists stand out within their own tribe — within their own religious sect — within their own close community?

I want a 'Tricorder' for evil. I would like to be able to detect intent. You have to understand how a person is motivated. Why would he or she want to become a terrorist? That is all tied into that linkage of tribal, cultural, social-economic and religious dynamics. How do those play together so that a person would want to become a terrorist and suicide bomber?

CHIPS: Are poverty and education factors?

Dr. Walker: There are many factors and I do not think any one thing derives it. If we could, we would be closer to the solutions. I do not think we have enough knowledge yet to firmly say the solution is close at hand. In science we call it degrees of freedom or hidden variables.

What drives behavior? Many things interplay with one another. It is a dynamic thing. We need to understand how it fits together.

There may be a way to affect future behavior in a way that terrorists and their close-knit sect would say, 'There is a better way. Violence is not the answer.'

To read about the ONR supported Nobel laureates, go to http://www.onr.navy.mil/about/nobels. Please go to the ONR Web site at http://www.onr.navy.mil/about/docs/walker_starnes_2006.pdf for Dr. Walker's biography. CHIPS

Interview with Dr. Patricia L. Gruber
Office of Naval Research Director of Research

Dr. Patricia Gruber

Dr. Patricia Gruber joined the Office of Naval Research in December 2005 as the Director of Research. She is responsible to the Chief of Naval Research for the oversight of the overall integration of the Discovery and Invention (D&I) science and technology (S&T) portfolio in support of naval mission areas. She has primary responsibility for maintaining a strong D&I portfolio in S&T areas that are of interest to the Navy, providing transition bridges to later stages of development and nurturing academic and naval S&T human capital resources.

Dr. Gruber talked about her work in August during the ONR Naval S&T Partnership Conference.

CHIPS: *What is in the D&I research portfolio?*

Dr. Gruber: Our portfolio is split into three segments. About 40 percent is the D&I portfolio, otherwise known as basic and early applied research. I have oversight for that portfolio. There are acquisition enablers, which include Future Naval Capabilities (FNCs), 6.3 work, SBIR or Small Business Innovative Research, and Manufacturing Technology, and then the things we call leap-ahead innovations such as Innovative Naval Prototypes and Swampworks.

I get to manage the stuff that is fun. By the time you get to 6.3 funding and the FNCs, which are designed to fulfill enabling capabilities and capability gaps that have been identified by the operational Navy and the acquisition community, they are well-defined.

On the other side, D&I is a broad portfolio. We try to come up with technology options that might be relevant or significantly contribute to FNCs. We might not see some things in D&I basic research pay off for 10 to 20 years, but it is where you can be creative in terms of looking for new ideas.

A typical path is for D&I to transition into an embedded naval prototype or future naval capability and then into a program of record. However, sometimes D&I transitions directly to the fleet, either through licensing of our technologies to commercial products that have been sold to the Navy and Marine Corps or directly in response to urgent operational needs. A good example is QuikClot which is a product we fielded rapidly to stem blood loss on battlefield casualties.

In May the Navy's Strategic Plan came out. It is at the top level where we start to think about what we need to do to support the Navy focus. We are working on our S&T strategy now. We tap a lot into the universities. My primary performers in the D&I

portfolio are about 60 percent university, about 30 percent in-house Navy laboratories, and that includes the Naval Research Lab, naval warfare centers and the remainder is industry.

CHIPS: *Did the war change the focus for long-term research?*

Dr. Gruber: Organizationally, ONR had already made changes that allowed us to focus on the global war on terror, expeditionary warfare and asymmetric warfare. The primary example is that we formed a department specifically focused on expeditionary warfare and the GWOT.

We made a big shift at the end of fiscal year 2004. ONR, under Rear Adm. Cohen, stood up a basic research program for countering IEDs, improvised explosive devices. A lot of the basic research that you see has to do with detecting devices but also trying to move further up the kill chain — and not just defeating the device — but defeating the system by looking at political, cultural and social networks.

Anytime you have asymmetric threats or enemies, the better you understand their mechanisms and networks — and all the pieces in their supply chain — the better off you are. We have seen more of an emphasis on those softer sciences.

CHIPS: *Can you describe some of the top research areas?*

Dr. Gruber: Battlespace environments research is about the ability to understand and model the environments that the Navy operates in – air, sea, undersea and space. It is also understanding the impact of those environments on the Navy systems that allow us to operate.

Sensors, electronics and electronic warfare have to do with developing the sensors for ISR (intelligence, surveillance and reconnaissance) communications, and electronic warfare for weapons and also self-defense.

Information systems involve getting the right information in a timely fashion to the right person in a form that they can use. It is situation awareness, it is decision making, and it is information fusion. It is a complex field critical to the Navy.

Sea and ground vehicles research involves building platforms that are high-performance, survivable, maintainable and reliable. A key component is power and energy. Not only energy from an affordability perspective but also as we introduce new capabilities. For example, directed-energy weapons on disparate platforms creates new, unique challenges for the power plants on those platforms.

Materials and processes are issues that cut across all the platforms and all the functional areas from vehicle to personnel protection. Corrosion alone costs the Navy about $3 billion in maintenance costs a year. In air platforms, similar to air-ground vehicles, we are looking for more efficiency and affordability. Reduced cost vertical lift is a big issue for operational capability.

Weapons research includes both undersea and airborne weapons.

The ultimate goal is long-range precision targeting with high probability of kill. This arena also includes the emerging directed-energy weapons and weapon countermeasures.

The last couple of areas focus on warfighter performance. Biomedical work tries to improve casualty care and understand the effects of stress, both mental and physical on our troops in tactical environments. We also fund work in undersea medicine to help more safely perform operations underwater.

Human systems research is another area that cuts across all capabilities and is critical. We can and do build the best systems in the world, but they are not useful, if we do not adequately train our personnel in how to use them. This department does a lot of work in how humans learn, how they make decisions, and the neural and cognitive processes associated with them. We are pushing the envelope on training technologies.

CHIPS: I noticed that your degrees are in marine science and oceanography. Are those your primary interests?

Dr. Gruber: I have a real affinity to programs in oceanography and underwater acoustics and marine meteorology. I resonate with those because those are the ones I grasp more intuitively. I also spent time in telecommunications and information technology so I'm interested in information and knowledge systems. My job though is to balance the portfolio across Navy and Marine Corps needs.

I am also fascinated by biomimetics and taking what we can learn from biological systems, Robolobster is an example, and applying it to make more efficient systems that perform better.

CHIPS: You talked about aligning the S&T budget to the POM 08, is there some flexibility there? (See the chart below.)

Dr. Gruber: Because of the types of funding mechanisms that we use, we typically award three-year grants to universities. One of the important outputs of D&I is not just technology, but it is technologists. This is where we are fostering the next generation of scientists and engineers. Hopefully, they will go on to work in the naval enterprises or perform work that is critical to the Navy in the future. In any given year, the research funds that ONR distributes support about 3,000 students, mostly graduate students, but some undergraduate. That is an important resource that we are fostering.

You do not make big shifts in the D&I portfolio in a given year. If you are funding students for a master's or Ph.D., they need to have stable funding. In FNCs, in a given year, 20 to 25 percent of those programs might turn over.

When I say align, I mean that we are trying to communicate what the priorities are to the ONR departments so the program officers making decisions have some strategies and guidelines. There is always more good work than you have money to fund, and you have to make hard decisions.

CHIPS: Your job is complex.

Dr. Gruber: I love it! It is challenging. There are a lot of demands on the Navy. I started my career in the DoD in the late '80s in the Naval Research Lab during the Cold War. If you look at what the Navy is called on to do now versus what they were called on to do then, the number of missions and variety of capabilities and requirements that they have facing them is astonishing.

That puts a lot of demands on S&T to be able to sustain those missions going forward. We in D&I have a long-term horizon and the Navy has a shorter-term horizon because the fleet is operational. That mismatch in expectations is sometimes a problem.

Naval S&T Investment by Performer

6.1 — Basic Research: 59%, 29%, 12%

6.2 — Advanced Technology Development: 12%, 19%, 69%

6.3 — Applied Research: 23%, 29%, 48%

Naval Labs and Centers
University & Nonprofit
Industry
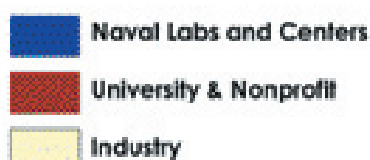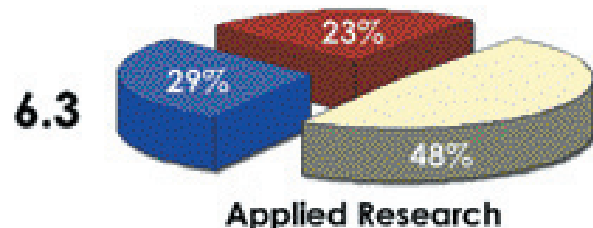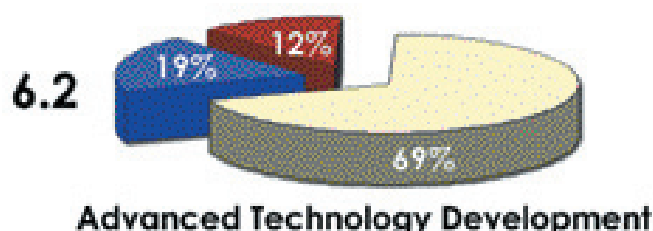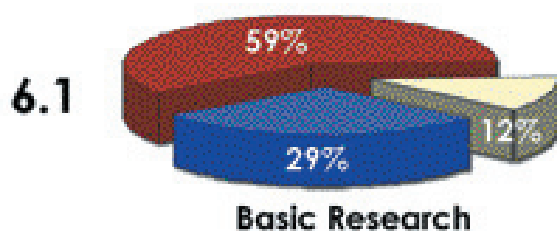
FY 2005 (Preliminary Performer Percentages 3/06)

We want to make sure that younger officers coming up through the ranks understand the value of S&T and understand that it is essential to make those long-term investments.

Secretary of the Navy Winter made an interesting comment that we all should be looking at what we are going to need in the future and not just continue to train the same types of people. A good example is information systems. Fifteen or 20 years ago we were not thinking much about hiring people who had expertise in information systems and networking.

CHIPS: In your role, do you engage with warfighters?

Dr. Gruber: My closest ties to the operational fleet are the ONR Global Science Advisors and the warfare centers. The warfare centers understand the S&T. They have the Navy perspective — a unique perspective that I cannot find at universities. The naval warfare centers are a national asset.

CHIPS: Do you have any concerns about the next generation of scientists and engineers?

Dr. Gruber: There is no doubt that we are seeing fewer and fewer American students choosing to go into science and engineering. However, I am an optimist. I think that trend will reverse. Before I came here, I was on campus at Penn State. Even though I did not teach, I interacted with students, and I noticed that students these days are much more savvy consumers than I was when I went to college.

I went into physics because I liked it in high school, and I thought it would be neat. I was not thinking about what kind of job I was going to get or where my job opportunities were going to be. Now students want to know what their return on investment is going to be. In recent history, the opportunity and the dollars have been in business and sports-related fields. It is supply and demand.

At Penn State, I was mentoring a freshman in materials science and I told her to do whatever she could to stay in a technology field. In the not too distant future the baby boomers are going to start retiring, and people are going to be clamoring for young professionals with technical skills. You will see that pendulum start to swing when they realize that there are significant opportunities in science and engineering.

The challenge that the Chief of Naval Research and I have decided to take on with our education and outreach is not to try to solve the problem with the shortage of scientists and engineers in the United States. Instead, we want to get those graduates that are coming out in science and engineering fields to be interested in working on Navy problems or working for the Navy.

We have to inform students about the great career options in science and engineering. I had my Ph.D. funded by ONR, and I went on to work on Navy problems.

Dr. Gruber's biography is available at http://www.onr.navy.mil/about/docs/gruber_patricia_2006.pdf. **CHIPS**

DNA-Biopolymer Photonics Program

By U.S. Air Force Lt . Col. Torsten Rhode

New and significant contributions have recently been made to the area of bioengineering. Dr. James G. Grote, from the Air Force Research Laboratory (AFRL), has been leading a team from around the world in investigating a new class of polymer, based on DNA derived from natural byproducts of the fish hatchery industry.

Contributions, like those made by researcher Lt. j.g. Kathleen Mandell, Ph.D., through a partnership with the AFRL and the Office of Naval Research Joint Science and Technology Reserve Project, and with the support of Dr. Frances Ligler, senior scientist for biosensors and biomaterials at the Naval Research Laboratory's Center for Bio/Molecular Science and Engineering (CBMSE), have helped the team develop the new biopolymer into a material which possesses unique optical and electromagnetic properties that no other known polymer has.

These include high and tunable conductivity and ultra low optical and microwave loss. Electronic and electro-optic devices fabricated from this new biopolymer have also demonstrated performance that exceeds the performance of the state-of-the-art devices fabricated from current organic-based materials.

Biopolymers may be the "silicon" of tomorrow's polymers, with a potential impact on a wide spectrum of both electronic and optoelectronic devices, while at the same time being inexpensive and easy to process. Where silicon is today's fundamental building block of inorganic electronics and photonics, biopolymers hold promise for tomorrow's fundamental building block for organic electronics and photonics.

This is significant because it demonstrates that biotechnology is not only applicable for genomic sequencing and clinical diagnosis and treatment, but can also have a major impact on non-traditional biotech applications as well, opening up a whole new field for bioengineering. **CHIPS**

Lt. j.g. Kathleen Mandell conducting tests on a DNA biopolymer specimen.

The Applied Research Laboratory Pennsylvania State University and the Office of Naval Research - A Strategic Partner Relationship

By Janet Jonson

ARL's Early Beginnings

As the Applied Research Laboratory (ARL) honors and celebrates the 60th anniversary of the Office of Naval Research (ONR) in this issue of *CHIPS*, we would be remiss not to mention the strategic partner relationship between these two organizations. Solving challenges for the U.S. Navy for more than six decades, ARL has been working hand-in-hand with ONR to address fleet issues.

Demonstrated innovation and practicality in technology-based research have facilitated the laboratory into becoming a leader in naval science and technology (S&T), with preeminence in undersea missions and related areas.

As a Department of Defense designated, Navy University Affiliated Research Center (UARC), ARL maintains a long-term strategic relationship with the Navy, while also providing additional support to the other services.

ARL provides world-class technology solutions for national security, economic competitiveness, scientific discovery, technology demonstration and transition to application. Equally important, ARL is preparing future naval research and development (R&D) scientists and engineers to lead our nation forward as we embark into a very challenging and dangerous 21st century.

Established in 1945 to further the work of Harvard University's World War II Underwater Sound Laboratory effort, ARL had an initial contingent of 100 employees. Today, there are more than 1,000 scientists, engineers, technicians, support staff and students. ARL has an additional 250 associate members throughout the various interdisciplinary colleges within the university from which it draws.

ARL's Premier Facilities

The lab today is primarily science and technology-based, with leadership extending into research areas that include: acoustics; guidance and control; thermal energy systems; hydrodynamics; hydroacoustics; propulsion; materials and manufacturing; navigation; communications and information; and education.

ARL has world-class facilities that enable its researchers to develop, test and demonstrate technology solutions for the challenges that face the Navy, other armed services and the Department of Energy.

These facilities, which support both ARL and sponsor-driven programs, are equipped with the latest in hardware and software, and are staffed by leading experts, skilled technicians, and both graduate and undergraduate students.

Seahorse-class Autonomous Underwater Vehicle (AUV) from the Applied Research Laboratory (ARL) at Penn State University slides free after being released from Sea Fighter´s (FSF 1) stern ramp during launch and recovery demonstrations. At 28 feet, six inches, and weighing 10,800 pounds, Seahorse is an untethered, unmanned, underwater robotic vehicle, capable of pre-programmed independent operations. The demonstration is sponsored by the Office of Naval Research. Photos courtesy of the Office of Naval Research and the ARL.

Intelligent Controller Architecture First Level Detail

Smart Sensor Inputs

| Sensor 1 |

| Sensor N |

| Messages |

Perception
• Sensor Data Fusion
• Information Integration
• Inferencing and Interpretation
• Situational Awareness

Response
• Operational Assessment
• Planning and Re-planning
• Plan Execution

Messages

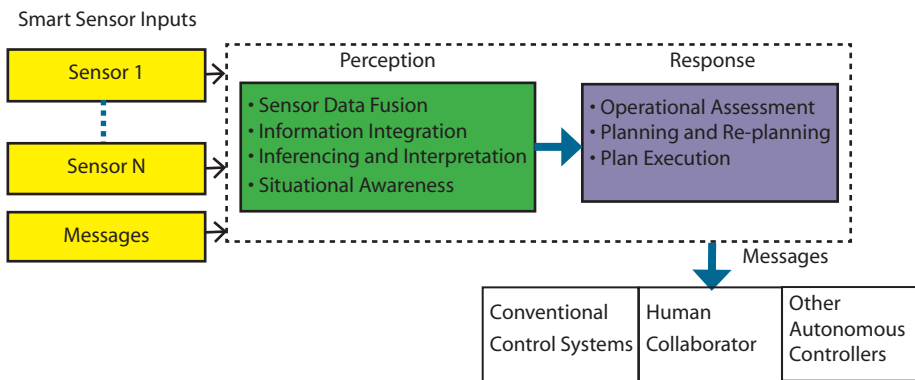| Conventional Control Systems | Human Collaborator | Other Autonomous Controllers |

Figure 1.

Some of ARL's unique facilities and usage include: an acoustic test facility for determining the acoustic characteristics of sonar devices; an advanced nuclear test facility to test and evaluate economically a wide variety of fuel component designs; the Garfield Thomas Water Tunnel, a 48-inch diameter, closed loop water tunnel for ships; a high pressure test facility that simulates deep ocean environments; and a materials processing facility that provides state-of-the-art coatings capabilities; and a number of test vehicles that support technology development and demonstration in the undersea environment.

The Synthetic Environment Applications (SEA) Lab is a multi-use test bed facility providing various users access to advanced visualization, simulation and collaboration technologies. A navigation facility, located at Warminster, Pa., conducts research and tests precise navigation sensors and equipment.

ARL has collaborated with ONR over the past 60 years to develop S&T solutions that provide new innovations for our Navy and Marine warfighters and continues to do so. Most of the research has been in the area of underwater systems. Under ONR sponsorship, the following are some examples of the research with which ARL has been involved over the years.

Supporting Arms — ONR's Penn State Applied Research Laboratory Connection

ARL has developed designs and demonstrated propulsors for unmanned undersea vehicles (UUV), in particular, the thrust-vector pumpjet propulsor technology, which has been transitioned to Boeing's Long Term Mine Reconnaissance System (LMRS) UUV and Lockheed Martin's Advanced Development Unmanned Undersea Vehicle (ADUUV).

ARL is a world leader in understanding the physics of the flow of fluids over surfaces and in different environments using computational fluid dynamics (CFD) tools. Ongoing research continues in the development of Navy CFD tools. ARL has developed technology in liquid metal combustion such as that used in the Stored Chemical Energy Propulsion System engine, a closed-cycle thermal engine of the MK-50 torpedo.

ONR is sponsoring the technology of synthetic aperture sonar to be used in various vehicles. ARL has provided advanced technologies for guidance and control systems for underwater weapons. One example of the strong partnership between ARL and ONR is the development of the Torpedo Intelligent Controller. TIC is a software architecture aimed at enhancing the adaptability and performance of torpedo guidance systems.

TIC uses a behavior-based architecture, shown in Figure 1. Each behavior module is self-contained, operates independently, and takes control when needed to perform its specific function. The behaviors take action depending on the situation being encountered allowing the tactical planning to occur in real time i.e., during the course of an attack.

As future threats emerge and technology develops, the architecture provides for future growth in capability. This becomes particularly important as weapon acquisition programs move to an Advanced Processing Build (APB) model.

Functionality of the TIC tactical software could be extended to conduct the full mission of the future torpedo guidance systems that utilize broadband sonar bandwidths and enable a common tactical control architecture. The intelligent controller architecture is also being used in other Navy applications such as contact awareness for submarines and control of prototype large diameter UUVs.

ARL's future is no less predictable and no less challenging than at any other time in its history. Uncertainties, as well as opportunities, abound. As the Department of the Navy and ONR assess the future and its R&D priorities, ARL stands ready to provide a viable resource to the Navy to initiate those priorities.

The roots of ARL Penn State's success can be traced back to 60 years ago when it became aligned with the Office of Naval Research. The leadership and guidance provided by ONR was then, and continues to be now, invaluable. ONR's support has allowed ARL Penn State to grow and serve this great nation.

The future success of the ARL Penn State will depend on its ability to create and apply innovative technology solutions to the many challenges and opportunities of today and tomorrow.

Our motto remains — Discover, Develop, Deploy.

For more information about ARL Penn State please visit our Web site at http://www.arl.psu.edu/.

Janet Jonson is an associate research engineer at ARL Penn State.

CHIPS

Interview with Dr. Joseph P. Lawrence III
Office of Naval Research Director of Transition

Dr. Joseph P. Lawrence

In 2004, Dr. Lawrence was selected as Associate Technical Director – Transitions for the Office of Naval Research with responsibility for more than one third of the Department of the Navy (DON) science and technology (S&T) budget, including the Future Naval Capabilities (FNC) and the Advanced Concept Technology Demonstration (ACTD) Programs.

As part of the 2005 reorganization at ONR, the ATD-T position was re-named as the Director of Transition. Dr. Lawrence is a member of the Senior Executive Service.

Dr. Lawrence discussed the ACTD program and his work with the Office of Naval Research in August.

CHIPS: Since Future Naval Capabilities are aligned to the naval capability pillars — Sea Shield, Sea Strike, Sea Base and FORCEnet, do you also look at FNCs in terms of operating in a joint and coalition arena?

Dr. Lawrence: The requirement that we have for developing and transitioning science and technology first, and foremost, is to serve the Navy and Marine Corps warfighters. In doing that, it clearly is to our advantage to see what other people have done, other services or other nations, and to pick and choose from the best S&T available.

We work very hard to maintain a strong and functionally diverse in-house S&T program, with particular focus on those areas where there is a unique or relatively unique need by the Department of the Navy, but we will adopt any advance, and from any source that we see as offering advantage to our warfighters. The FNC program specifically is charged with addressing closure of warfighter defined capability gaps by the introduction and transition of technology from any source.

In terms of interoperability, it is in the best interest of the Department of the Navy, the fleet and forces for us to look for opportunities for developing systems that work not just with other services within the United States but also with coalition partners. The Chief of Naval Operations' vision of a thousand-ship Navy, for example, explicitly requires an interoperable coalition force.

CHIPS: The Navy and Marine Corps missions have evolved beyond conventional warfare. Did these emerging requirements require a shift in focus for ONR?

Dr. Lawrence: Yes, they did. A good example is that when we first started with the FNC process and the DON governing board for FNCs, the Technology Oversight Group (TOG), met to ratify the initial list of capability gaps that we were to work to, Lt. Gen. Ed Hanlon, then commanding general of the Marine Corps Combat Development Command, said that he thought the capability gap list was well conceived by the OPNAV staff, but that he had Marines fighting that day in Iraq and he didn't see any capability gap addressing urban, asymmetric warfare, nor any other specific requirement for the war on terrorism.

By acclamation, a vote was taken by the TOG to add an urban, asymmetric counterterrorism requirement as the number one priority on the capability gap list that we work against. It has been refined since then to include maritime domain awareness and maritime security issues as well; and it has been broadened from exclusively urban warfare to include riverine operations and other asymmetric littoral operations.

CHIPS: Do you work with the Department of Homeland Security?

Dr. Lawrence: We do not have specific ongoing joint programs right now at the Department level, but we do work closely with them at the component level. As an example, the DON has a maritime security technical advisory group (MSTAG) that includes Coast Guard representatives on the executive panel.

We are working with the Coast Guard to develop a coordinated maritime domain awareness and maritime defense capability, at least, in part, in response to National Security Presidential Directive (NSPD) 41.

As you know, retired Rear Adm. Jay Cohen, who just completed a five-year tour as chief of Naval Research, is the new under secretary for science and technology in the Department of Homeland Security. He is in the process of reorganizing the DHS S&T organization and looks to be establishing an S&T management structure similar to the one he set up at the Office of Naval Research.

My counterpart there as Director of Transition, Dr. Robert Hooks, will be coming here to spend some time with me this afternoon to discuss our transition development process.

My understanding is that his intent is to better understand how we have identified requirements, developed S&T programs, and worked to see them transition as a way of helping DHS understand how to better organize its own R&D efforts.

I will of course work with him to help in any way I can, but will also look to use this meeting as an occasion to identify opportunities for collaborative work. We have such large areas of potential collaborative work that I think we both would be remiss in not forging a strong working relationship.

CHIPS: Can you discuss the ACTD process; it seems complicated.

Dr. Lawrence: Well, the process is complicated, but for some good reasons. The topline intent is to enable the Director of Defense Research and Engineering (DDR&E) staff to foster R&D responses to combatant command/commander (COCOM) needs, but responses that are joint in nature. By joint here, I mean involving either multiple U.S. services or a U.S. service and an allied service. The process is largely driven by the COCOMs and is open to government, industry and, of course, to allies.

Because it is so open, there are many paths for introducing proposed Joint Capability Technology Demonstrations (JCTD) into the system, not all of which will garner service support or service acquisition funding. We have people coming in from industry or from the laboratories and centers within the government who have good ideas and present them to a COCOM to generate support for a prospective JCTD, but they may have no support from a service.

If the idea is really good and is approved as a JCTD, we then have to scramble to figure out how to identify service funds frequently outside of the POM process. In these cases, some already approved, and possibly a higher priority program, suffers by having to pay the bill. To avoid this less than desirable situation, we've been working pretty hard lately to figure out how to mine the FNC program for JCTD proposal ideas.

Developing JCTDs from within an approved FNC will enable us to meet COCOM needs, and gain joint support and involvement in approved Department of the Navy R&D. At the same time, we can start with a DON commitment to provide development and acquisition funding if the JCTD is successful.

Before she left, I talked to Ms. Sue Payton, she is the former deputy under secretary of Defense for advanced systems and concepts; she was nominated April 25, 2006, for assistant secretary of the Air Force for acquisition, research and development. She encouraged us to identify projects that are funded for which we have identified transition customers in the acquisition world, and to look within that list for projects that would do well as a joint program that address COCOM requirements. That's what we have been working to do.

If we are successful, we will identify a need by the COCOMs that we can address with a commitment by at least one service to take it into acquisition and production.

The alternative, failure mode is when we don't have service support for acquisition, and nevertheless, are directed to fund a JCTD. In these cases we spend the R&D money to develop one or two prototypes and may end up with no maintenance tail and

no follow-on production to supplement the fielded demonstration units from the JCTD.

CHIPS: I have heard that sometimes problems stem from users predetermining a solution before giving the research centers the opportunity to identify the best one.

Dr. Lawrence: That's something we all have to contend with in the S&T community, where the definition of the requirement is often presented in the form of someone else's solution. This places a burden on the S&T community to talk to the end users to work to better understand what their real requirements are and then to identify to them the available S&T solutions, which may not be what they originally conceived but may better solve their problem. The burden is on us to better understand warfighter requirements.

CHIPS: Who are the members of the FNC integrated process team?

Dr. Lawrence: There is a Technology Oversight Group (TOG) that provides overall governance for the FNC program. Vice Adm. Kevin Cosgriff, deputy commander Fleet Forces Command, is the fleet/forces member. Vice Adm. Lewis Crenshaw, deputy chief of Naval Operations for resources, requirements and assessments-N8, is the OPNAV member.

Commanding General of the Marine Corps Combat Development Command, Lt. Gen. James F. Amos, is the Marine Corps HQ member. Deputy Assistant Secretary of the Navy Research, Development, Test and Evaluation (DASN RDT&E) Dr. Michael McGrath, is the ASN RDA member. The Chief of Naval Research Rear Adm. William Landay, is the S&T member. Underneath the TOG, there are five Sea Power 21 Pillar integrated process teams that have responsibility for monitoring individual FNC products and ensuring their transition to the fleet and forces.

CHIPS: What is their role on that team? (See Figure 1 below.)

Dr. Lawrence: The oversight group works along well-prescribed lines of responsibility. The OPNAV staff and Headquarters Marine Corps do the analysis that leads to the definition of require-

Figure1. IPTs provide the forum for achieving stakeholder consensus

Requirements
• Identification of gaps and requirements
• Alignment of transition funding

FNC IPT

S&T
• Development of responsive S&T enabling capabilities that satisfy the requirements
• Execution management of S&T

Acquisition
• Identification of S&T products and delivery to the warfighter

Fleet/Forces
• Assist in identification of gaps and requirements
• Assessment: Does this meet the needs?

FNC S&T IPTs

Sea Strike FORCEnet
Sea Basing Sea Shield
Enterprise & Platform Enablers

S&T Corporate Board

VCNO ASN RDA ACMC
CNR – Executive Secretary

MCCDC   N8
TOG   DASN RDT&E
CFFC   CNR

N1/N00T BUMED

Sea Warrior S&T

Separate Oversight Process for Medical and Training S&T

ments. They provide us with capability gaps. These come out of the Sea Power 21 analysis process.

They scrub through a larger set of capability gaps to identify which of the gaps are S&T related as opposed to funding or operations-related items. They give us a subset of the Sea Power 21 gaps, that is, the ones that require S&T input.

ONR defines product and program proposals that address closing those gaps — after analysis and discussion with the warfighter and the OPNAV and Marine Corps Headquarters staff. The Sea Power 21 Pillars IPTs evaluate our proposals to determine which ones have the highest priority impact on the gaps they have defined. Through final vote by the TOG, they give us a prioritized list of those proposals, and we fund as many as we have available funding to support.

The process gives the Headquarters Marine Corps and OPNAV staff members of the TOG responsibility for defining the requirements and for prioritizing S&T. ONR has responsibility to identify the available S&T. The fleet and forces representatives and the acquisition representatives have interplay in the process.

The acquisition community provides advice that 'if you fund this S&T and expect to get into production, this is what we see as the issues' and ultimately what the cost is for the acquisition. The fleet and forces representatives have to weigh in and indicate what they see as a priority for operational use.

The process works well. The senior representatives are well engaged in evaluation of the work that we are doing and in defining requirements for us.

CHIPS: Once an ACTD has transitioned into a program of record and is in production, does ONR still have a role to play?

Dr. Lawrence: From an ACTD, or now JCTD standpoint and for FNC projects, our role in a formal sense ends with the completion of the S&T content and delivery to an acquisition customer. However, Rear Adm. Landay has indicated that he does not define success for S&T to be handing over a product to the next higher order of funding, which is the acquisition community.

Rather, the measure of success that he wants us to use is to achieve ultimate delivery of the S&T product to the fleet and forces. So, while we do not have a formal role in the acquisition process, we do need to maintain contact to provide continuity in acquisition and to track the process as the S&T product transitions through acquisition and on into production and delivery.

What we newly have initiated then is a process for tracking the S&T as it progresses through acquisition and into operational use. Rear Adm. Landay has introduced this as a metric that he wants to track. It is a new metric, but it is a critical one, and a good measure of true success for S&T.

CHIPS: Can you talk about any recent success stories in transitioning capabilities to the Navy or Marine Corps?

Dr. Lawrence: Yes indeed, with pleasure. There have been a large number of successful transitions within the FNC program, in particular, we have started completing the products first initiated in fiscal year 2002. I'd like to highlight just a few of them.

Within the past year we tested and delivered to the Navy and Air Force a JDAM assault breaching system combining existing JDAMs with an FNC developed lethality-based mission planner to achieve a significantly improved capability by the Marines to breach obstacles and surface mines in surf and beach zones.

We developed and delivered a highly sensitive, low probability of intercept (LPI) electronic warfare receiver that has transitioned to classified Army and Air Force programs, has been used by EP-3s (electronic reconnaissance aircraft) in Iraq in search of special signals, and is being procured in quantity for installation on board most Navy submarines.

We developed and delivered software to the Program Executive Office C4I PMW-159 that resulted in a five-fold increase in Link 16 instantaneous capacity by implementation of new dynamic network management and time slot allocation protocols.

For Littoral Combat Ship (LCS) use, we developed an airborne communications package for Fire Scout. We developed and delivered a three-camera shipboard distributed aperture sensor to perform panoramic infrared search, anti-ship cruise missile (ASCM) detection and tracking, and asymmetric threat surveillance for use on LPD 17-class amphibious transport dock ships and Arleigh Burke-class (DDG 51), and cruiser (CG) class ships.

We developed also a QuikClot advanced clotting sponge as a next generation life saving agent for battlefield control of moderate to severe bleeding. This product has recently been in final review for use in the Individual First Aid Kit (IFAK) carried by every Marine.

From a related ONR program, the Rapid Technology Transition (RTT) program, I should also highlight a recent titanium nitride T-58 compressor blade erosion resistant coating that is now being deployed to achieve an estimated $56 million estimated life cycle cost savings and a two-fold engine lifetime improvement in desert environs.

We at ONR and within the overall Naval Research Enterprise are rightly proud of the successes we've been able to achieve so far, but we do recognize that we need now to work even harder to ensure that the warfighters in our fleet and forces continue to enjoy the technological superiority that we all have come to expect and rely on.

For more information about the Office of Transition go to http://www.onr.navy.mil/sci_tech/3t/.

Dr. Lawrence's biography is available at http://www.onr.navy.mil/about/docs/lawrence_joseph_2006.pdf. CHIPS

Reserve Program 38 Supports ONR

By Lt. Cmdr. Jay Bartish

During Fleet Week in May in New York City, the Office of Naval Research (ONR) showcased some of the Navy's newest and future technologies on board USS Kearsarge (LHD 3). Reserve Program 38 personnel assisted the ONR staff by explaining projects to guests touring the ship. The Reservists are members of ONR and Naval Research Lab units based around the country.

Each detachment is composed of naval officers who are typically warfare qualified and have advanced engineering or technical degrees. They serve as liaisons between ONR's mostly civilian staff of scientists and researchers and the warfighters in the fleet and force who serve at the pointy end of the spear.

The Fleet Week Reserve team included Cmdr. Anthony Nickens, Cmdr. Dan Pedro, Cmdr. Paige Terry, Lt. Cmdr. Jay Bartish, Lt. Cmdr. Eric Neumann and Lt. Cmdr. Heath Rasmussen. Projects exhibited during Fleet Week included those listed below.

The Revolutionary Approach to Time-critical Long Range Strike (RATTLRS) demonstration, led by ONR and supported by the Air Force, NASA and the Defense Advanced Research Projects Agency will create a new standard for time-critical strike weaponry. The end result will be a high-supersonic cruise missile capable of speeds greater than Mach 3 that can be launched from Navy and Air Force platforms, including surface ships, submarines and aircraft.

Coyote is a 36-inch long, 12-pound expendable unmanned aerial vehicle (UAV) designed to be deployed from sonobuoy launch tubes on Navy aircraft such as the P-3C Orion. The UAV has a digital camera and datalink that can relay real-time video back to the aircraft. It provides surveillance of contacts of interest or visual identification of radar contacts while an aircraft remains at altitude. After launch, Coyote deploys folded wings to maintain stability as it glides down in a spiral designed to keep an object of interest in view.

The Silver Fox is a small tactical UAV using off-the-shelf avionics. ONR's Tech Solutions office, which finds quick technology solutions for the Navy and Marine Corps, identified the UAV as a means to provide real-time imagery intelligence for Marines at the company and battalion level. The Silver Fox UAV was originally developed to assist the Navy in avoiding migrating whales while on maneuvers.

At 22 pounds, and roughly the size of a large remote-controlled model aircraft, it is a highly portable system that can be easily transported in a humvee. The entire system consists of three aircraft, a ground station and launcher. Once airborne, Silver Fox uses an infrared, high-resolution color zoom camera to relay reconnaissance information instantaneously to a remote laptop computer.

The UAV is made of composite and ceramic materials and is equipped with an automatic flight control system that can fly the UAV to user-defined waypoints; it does not require a dedicated operator. An on board datalink can transmit pictures back to Marines 20 miles away. The UAV has a flight endurance of 10 hours with a top speed of 55 mph. It can be recovered using a net, or can glide to land on the ground or water — and it floats.

The Lightweight Mortar System is a joint program with the Army's Armament Research Development and Engineering Center. The system uses modern materials and concepts to reduce the weight of an 81 mm mortar. The new system has a cannon made from a nickel superalloy called Inconel 718, which weighs about 10 pounds — 30 percent less than a steel tube. Inconel 718 offers superior strength during periods of sustained high rates of fire. Production is expected to begin in 2008.

LightSpeed, a new communications system, uses infrared light to transmit digital voice, video and data signals from one pair of binoculars to another. Initial applications focus on vessel boarding search and seizure communications to pass biometric data back to the ship, as well as ship communications during "radio blackout" situations.

LightSpeed is also being considered for submarine communications with aircraft; explosive ordnance disposal communications; unassisted UAV landing/surveillance; for flight deck personnel to assist with asset tracking and communications; and convoy communications. Prototypes attach easily to "Big Eyes" binoculars with a range of five nautical miles.

VirtuSphere is an 8.5-foot diameter sphere that enables immersive, physical training in virtual settings. The meshwork plastic hollow sphere sits atop a set of wheels, which allow unlimited rotation in any direction. Once inside the sphere, the user dons a wireless head-mounted display and can then walk or run in any direction within the virtual environment.

Virtual environments are great for "anytime, anywhere" training. Their benefits include increased training repetitions, scenario diversity, lower costs, fewer logistical hurdles and increased safety. VirtuSphere provides an accurate experience of the physical fatigue associated with moving through a combat scenario.

SpeechGear is a suite of language transmission software to assist Marines and Soldiers in communicating with allies or adversaries. The software instantly translates everything a person sees, hears, says, reads, writes or types.

SpeechGear's Endurance Tablet PC is a rugged portable system built to withstand all weather conditions. Its high-resolution display is viewable in all lighting conditions, from bright sunlight to total darkness. Its multi-element noise-canceling directional microphone array and four-speaker audio system eliminate the need for a headset. The system is currently being evaluated by front-line troops in Iraq.

Lt. Cmdr. Bartish is the assistant administration and training officer for the Navy Reserve Office of Naval Research/Naval Research Lab Science and Technology 105, a Reserve detachment located at Naval Operational Support Center, Little Creek, Va. **CHIPS**

Mimicking Nature — using nonlinear dynamics and chaos theory to enhance performance and transform naval systems

By Dr. Frank E. Gordon

Scientists are learning what nature has known for years — that nonlinear and chaotic systems can provide improved performance. Biological systems, from the nonlinear electrical control signals in the heart to computational methods in the brain, use nonlinear and chaotic processes to survive. The challenge is to understand and apply these techniques to improve man-made designs.

Mention nonlinearity, noise and chaos to most engineers, and they will tell you that they were taught to design systems to avoid these pitfalls. But a group of Navy scientists at the Space and Naval Warfare Systems Center (SSC) San Diego, working closely with fleet users, is developing multiple systems that take advantage of these properties to significantly improve performance.

In some cases, *they are providing an order of magnitude increase in performance along with a reduction in cost, size and power requirements.* The SSC San Diego scientists believe that this technology will be critical for the Navy to fulfill the warfighting challenges of Sea Power 21.

Engineers have known for years that instability helps in the design of high performance aircraft by providing increased maneuverability. In fact, today's jet fighters are so unstable that even the best pilots need the aid of a computer just to fly straight and level. The pilot inputs commands through the control stick to direct the plane, and the computer adjusts the control surfaces to provide the desired response.

Scientists and engineers have also known that most things, including electronic components, mechanical systems, living organisms, and our environment, are inherently nonlinear. Conventional engineering practice has been to design systems to be "linear" devices by limiting the operating range to regimes that exhibit quasi-linear performance.

The owner's manual of a stereo system amplifier, for example, provides plots showing a range over which the output is linear. To avoid the distortion that occurs when the amplifier is turned up too high, users often buy systems with significantly larger power supplies than are required to help ensure distortion-free sound in the listening range. Such designs come at the price of increased size, weight, cost and reduced performance.

Nonlinear dynamics is a relatively new science that traces its recent emergence to a paper published in 1963 by a meteorologist named Ed Lorenz. Lorenz used relatively simple nonlinear equations to mimic weather patterns. While these equations produced results that resembled weather patterns, they also demonstrated that extremely small changes in initial conditions could result in significant changes over time, thus limiting the achievable accuracy of long-term weather predictions.

The often cited example is that of a butterfly flapping its wings in China. Through a connected chain of events, the butterfly's movement in China ultimately results in a hurricane forming in the Atlantic Ocean.

Throughout the 1970s and 1980s, basic research in nonlinear dynamics and chaos theory advanced with little practical application. In the 1980s, the Office of Naval Research (ONR) began a program in nonlinear dynamics under Dr. Michael Shlesinger to promote research that would lead to practical applications.

One of the first applications of interest to the Navy was the development of a dynamic control system for crane barges that allowed the operation of cranes in higher sea-states than was previously possible. Additional research at the Naval Research Laboratory (NRL) focused on the use of chaos theory to encrypt messages for secure communications.

At SSC San Diego, Dr. Adi Bulsara performed basic research and published several papers on stochastic resonance, a phenomenon that takes advantage of the noise and nonlinearity inherent in most sensors to enhance the detection of signals. In the late 1990s, SSC San Diego recognized the potential of nonlinear dynamics to revolutionize warfighting, and embarked on a program to recruit scientists and engineers with backgrounds in nonlinear dynamics to focus on the development of new applications.

Some of the Navy's highest priorities, such
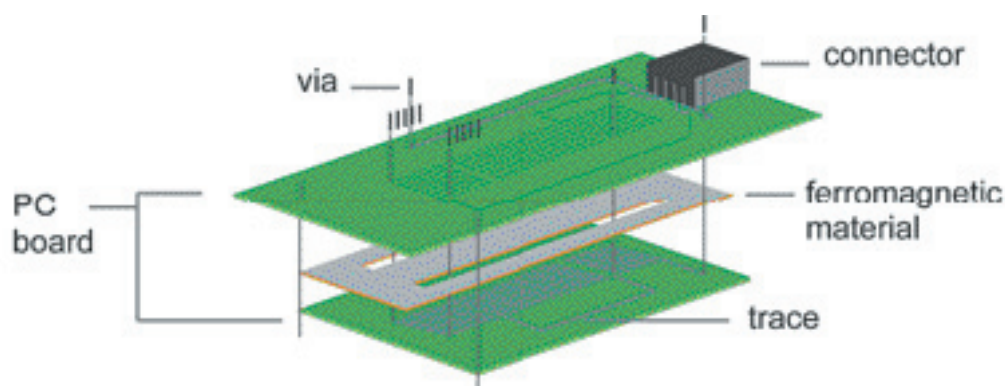

Figure 1.

Exploded diagram detailing the construction of the fluxgate magnetmeter fusing the three-layer construction design. The two outer layers are printed circuit boards with copper wirings printed on them to form the sensing coils and the excitation coils. The middle layer is the special ferromagnetic material shaped to confine the field which helps to enhance the device performance.
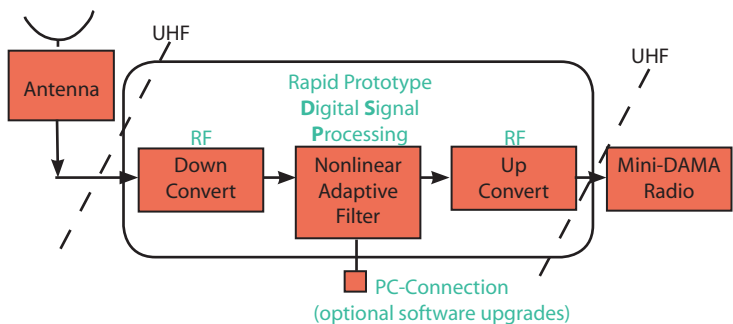
Figure 2. For legacy applications, the nonlinear adaptive filter is placed between the antenna input and the radio. The technology can be incorporated into new radio designs.

as improved communications, increased bandwidth, improved sensors, and more effective countermeasures for dealing with improvised explosive devices, are currently being addressed by nonlinear dynamics technology.

A nonlinear sensor for magnetic detection is one example. For this application, a variant of stochastic resonance is applied in the design of a nonlinear fluxgate magnetometer to detect the metal in objects that range in size from guns and rifles to the hull of a submarine (see Figure 1).

Conventional magnetometers require expensive readout and control electronics that add cost and increase size and power consumption. By contrast, the nonlinear dynamic sensor uses a fundamentally different measurement technique that takes advantage of the full dynamic range of the sensor material.

Increased communication data rates and higher bandwidths are also high priority requirements being addressed by nonlinear dynamics technology. SSC San Diego, ONR and the Submarine Communications Program Office have an innovative solution in development.

A submarine's ultra high frequency satellite communication (UHF SATCOM) antenna is constrained by the size of the submarine mast and must operate a few inches above the ocean surface — where sea states can create dynamic multipath reflections.

Further compounding this environment, UHF SATCOM channels are frequently unusable due to in-band, co-site narrowband interference. For this application, a nonlinear adaptive filter is being designed to remove both the interference

and multipath signals, thereby increasing the number of usable UHF SATCOM channels while maximizing the data rate.

For the initial implementation, the filter is installed between the antenna feed and the UHF radio so that it can be adapted for legacy radios (see Figure 2). In laboratory tests using prototype hardware, the nonlinear filter has demonstrated the ability to reclaim unusable SATCOM channels. The system is scheduled to go to sea on a submarine this fall. The goal is to provide the new filter and all associated electronics in a package about the size of a pack of cigarettes at a cost of less than $1,000.

A low cost, phased array antenna is another application that was studied at SSC San Diego under an ONR exploratory development program. The nonlinear, phased array antenna treats the array elements as nonlinear-coupled oscillators that can be made to self-synchronize to form, direct and shape beams.

The design takes advantage of inherent nonlinearity to eliminate expensive phase shifters, wave-guides, and the beam-steering computer and replaces them with low cost ASIC (application specific integrated circuit) radio frequency chips and off-the-shelf parts. By controlling the coupling between elements, a gradient can be formed across the array to both steer and shape beams.

Nonlinear dynamicists at SSC San Diego and its collaborators are exploring additional applications by studying the cells, nervous systems and brains of living organisms. By examining biological systems, dynamicists are finding new functionality in a single transistor.

By recognizing nonlinearities in analog

circuits, they are finding ways to perform functions using less complicated systems than conventional "linear" counterparts. This approach is offering new possibilities in the development of sensor, signal processing and decision-making systems.

Hybrid digital and analog electronic circuits, which are compact and low power, are being developed for signal processing applications over a broad range of frequencies. Other designs take advantage of coupled nonlinear oscillators and pattern formation to generate nervous system-like signals.

These designs are being applied to walking robots and other autonomous vehicles. The philosophy of adopting nonlinearities and of examining biological systems is also bridging the gap between hybrid biological and electrically engineered systems.

For example, by modeling neuronal functions on a microchip, hybrid electronic-neuromorphic circuits have been created and have demonstrated that a single leach neuron can perform traditional functions such as addition and multiplication.

More advanced experiments have demonstrated that a hybrid system, consisting of a neuronal network of living neurons grown on a silicone circuit base, was capable of navigating a virtual mouse through a computer-generated videogame-like maze. Concepts like these may redefine the role of computers in our future society.

These are only a few of the potential applications expected to result from nonlinear dynamics technology. Remembering that most systems in use today were designed to avoid the inherent nonlinearities rather than taking advantage of them, this technology holds the potential to provide capabilities far beyond current systems, leading to a transformational revolution as we enter the 21st century.

Dr. Frank E. Gordon is the head of Navigation & Applied Sciences Department, SSC San Diego.

CHIPS

Homeland Security Presidential Directive - 12

By Sonya Smith

October 2006 marked the implementation date for issuing federal identification credentials in accordance with the Homeland Security Presidential Directive-12 (HSPD-12) standard …

President Bush signed HSPD-12 in August 2004; the directive sets a mandatory governmentwide standard for secure and reliable forms of identification for federal employees and contractors. HSPD-12 also requires the use of identification by federal employees and contractors that meets this standard in gaining physical access to federally controlled facilities and logical access to federally controlled information systems.

What this directive means for federal agencies is that they must use a secure and reliable identification that: (a) is based on sound criteria for verifying an individual employee's identity; (b) is strongly resistant to identity fraud, tampering, counterfeiting and terrorist exploitation; (c) is rapidly authenticated electronically; and (d) is issued only by providers whose reliability has been established by an official accreditation process.

The Department of Defense has a tremendous investment in the Common Access Card and the Public Key Infrastructure. Therefore, the CAC has been officially approved to be the DoD vehicle for HSPD-12 compliance. Changes are in store for the CAC and its issuance process to make it HSPD-12 compliant. Among other HSPD-12 required items, a contactless capability will be added using radio frequencies to transfer data between the card and the reader *(vice having to read the CAC's magnetic stripe or bar code)* and adding biometrics (a facial image and two electronic fingerprints) to the card.

The HSPD-12 compliant CAC will be phased in over time through 2010. The DoD has an initial operating capability solution at the Defense Manpower Data Center (DMDC) and will gradually deploy the capability throughout the Defense Department. Additional changes are on the horizon as the DoD pushes to maximize usage of the CAC. The Joint Task Force for Global Network Operations (JTF-GNO) Communications Tasking Order accelerated the implementation of PKI technology. This tasking order ties in perfectly with the HSPD-12 requirements and the Department's use of the CAC as a common identification standard for logical access.

The DoD now needs to establish the same type of momentum on the physical access side that the JTF-GNO Communications Tasking Order provided on the logical access side. Defense Department personnel are now using the CAC for applications that include digitally signing and encrypting e-mail, arranging travel, managing food service and tracking weapons issuance.

Reducing the number of different types of credentials issued, and using the CAC to its fullest potential as the standard physical access card will improve DoD's security posture and result in cost savings. Commands considering purchasing or upgrading physical access control systems (PACS), will need to verify whether the vendor is on the General Services Administration approved products list for HSPD-12 compliant products and services. They should also obtain a copy of the National Institute of Standards and Technology (NIST) certification to verify Federal Information Processing Standard (FIPS) 201-1 compliance before proceeding with any PACS purchases.

DMDC has produced a couple of key reference documents (see text box below) to assist: DoD CAC Middleware Requirements Release 3.0, Version 1.0 of 21 March 2006; and the DoD Implementation Guide for the NIST Special Publication 800-73, which defines the interfaces for personal identity verification.

However, commands considering the purchase of PACS should stay tuned. The DMDC currently has a pilot underway with all the military services to: (1) Test interoperability with existing Defense Department PACS; (2) Standardize at ISO 14443, Parts 1-4 at 13.56 Mhz; (3) Test the ability to read and interpret the HSPD-12 required card holder unique identifier; (4) Gain understanding of the impact of standardizing physical access control technology; and (5) Test interoperability with other federal sector departments and agencies. The reports from this pilot will be available next quarter.

One of the things that the DMDC discovered during the physical access pilot is that getting the middleware specifications correct is critical. The new middleware requirements must be defined for vendors to ensure they have the appropriate middleware to support HSPD-12 end state cards from any agency as well as the HSPD-12 compliant CACs.

The changes to the CAC to make it HSPD-12 compliant, such as the addition of contactless interface and biometrics, will bring much anticipated improved functionality to the CAC. Change is always difficult, but HSPD-12 promises a new era of interoperability between federal agencies.

Reference Documents to Help You Get Started

HSPD-12, Homeland Security Presidential Directive, August 27 2004, Policy for a Common Identification Standard for Federal Employees and Contractors: http://www.whitehouse.gov/news/releases/2004/08/20040827-8.html.

FIPS 201-1 Federal Information Processing Standard 201-1, Personal Identity Verification (PIV) of Federal Employees and Contractors, March 2006: http://csrc.nist.gov/publications/fips/fips201-1/FIPS-201-1-chng1.pdf.

Government Approved Services and Products: http://idmanagement.gov/drilldown.cfm?action=gov_app_products.

DoD CAC Middleware Requirements Release 3.0, Version 1.0, March 21, 2006: http://www.dmdc.osd.mil/smartcard/owa/ShowPage?p=DevloperSupport.

DoD Implementation Guide for NIST Special Publication 800-73: http://www.dmdc.osd.mil/smartcard/owa/ShowPage?p=HSPD12.

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CHIPS

Interview with Navy ERP Program Manager Ron Rosenthal and Navy ERP Technical Director Susan Keen

The U. S. Navy announced in June that its Navy Enterprise Resource Planning program (Navy ERP), successfully completed the close out of its Critical Design Review (CDR). The successful review provided a clear path forward for the programs Navy-wide business management capability. The Navy's implementation schedule calls for the money management and program management portions of the ERP capability to begin operation Oct. 1, 2007, at the Naval Air Systems Command (NAVAIR).

An additional business management package will be added at the Space and Naval Warfare Systems Command, (SPAWAR) in April 2008. The supply release is scheduled for the Naval Supply Systems Command, (NAVSUP), Oct. 1, 2008, and the maintenance package will be implemented at the Naval Sea Systems Command (NAVSEA) Oct. 1, 2010.

The ERP is an ACAT IAM Program.

CHIPS asked Mr. Rosenthal and Ms. Keen to discuss the significance of the ERP program and its technology suite.

CHIPS: What is Navy ERP?

Rosenthal: ERP is a generic name of a software-based management system that corporations have used for several years. The earliest systems were developed in the early 1980s. Companies use ERPs to power their crucial business functions.

Our solution, Navy ERP, utilizes SAP, a product owned by the SAP Corp., based in Walldorf, Germany, the largest provider of ERP solutions in the world. They have more than 28,000 implementations, both in industry and in government.

Our solution allows the Navy to unify, standardize and streamline all its business activities into a single system that will achieve the highest standards for information that is secure, reliable, accessible and current. Everyone involved in conducting the business of the Navy will be working from the same 'sheet of music,' rather than what we have today — disparate systems where a lot of time is spent reconciling information.

Another major benefit of Navy ERP is that processes are updated and simplified, and redundancies are eliminated. This is necessary in order to drive efficiencies into our daily operations to save money.

CHIPS: What modules are included in the suite of applications?

Keen: We are using many of the modules offered with SAP. The modules cover the functional areas of finance, acquisition and program management, workforce management, supply, materials management and plant maintenance. That's a very broad implementation, although not surprising, given that the Navy is a very large organization, and we cover the waterfront in terms of functional needs.

We have organized our solution to cover eight very broad-reaching end-to-end 'Process Scenarios.' A couple of examples are 'Plan-to-Perform' and 'Acquire-to-Dispose.' They allow us to represent all the steps in an end-to-end process and collectively they cover the business of the Navy.

For example, in the Plan-to-Perform and Acquire-to-Dispose processes, all aspects of Navy project management from initiation, planning and execution to project closing are covered. These processes can be applied to any project effort in the Navy within the General Fund or Working Capital Fund environments and across the entire project life cycle from acquisition to disposal.

So you can see these examples cover financial, acquisition, procurement and all aspects of resource management. We have approached each of our eight end-to-end processes as comprehensively as that.

The system provides the ability to see information across functional areas, allowing managers to make decisions that are reflective of the entire process, not just a small segment of the process, which is often the case today when managers see limited information based on stovepiped systems. Better information means better decisions. We believe it will make a huge difference in terms of the visibility of information around any resource area or any process area in the Navy.

CHIPS: Which organizations had input into the requirements and design of the ERP?

Rosenthal: The Navy decided in 1999 to proceed with pilot tests of the ERP capability. The organizations involved in the four pilots were SPAWAR, NAVAIR, NAVSUP, NAVSEA and Fleet Forces Command. The implementation of these test pilots gave us the tremendous benefit of understanding the capabilities we wanted to bring into the Navy that could be enabled by an ERP — all this information and data were used as a foundation to establish the requirements.

When we started the initial planning of the program, we worked with OPNAV. With the help of the different groups within that organization, N4, the deputy chief of Naval Operations for fleet readiness and logistics, became our program sponsor.

One of the first things N4 did was draft the Operational Requirements Document (ORD), which was staffed throughout the Navy. The ORD was formally signed and became the foundational requirements document for the program. Since then, we have created a Requirements Analysis Group (RAG), which is chaired by Fleet Forces Command. If additional requirements are desired, they are submitted and approved by the RAG before being forwarded to N4 for consideration.

The Navy's Financial Management and Budget (FMB) and the Financial Management Office (FMO) also played a major role in creating the requirements. Both report to the Assistant Secretary of the Navy (Financial Management and Comptroller). Navy ERP is the cornerstone of the Navy's Financial Improvement Program.

CHIPS: Who will be the users of this tool?

Rosenthal: In the near term, we will roll the solution out to SPAWAR, FMB, NAVAIR, NAVSUP and NAVSEA. Then, we will move into the Regional Maintenance Centers (RMCs) and the Fleet Readiness Centers (FRCs). Specifically, everyone who does his or her time and attendance, to program managers who will use the system to help them manage their programs, people in finance, contracts, and supply and maintenance will benefit from the ERP solution.

We want to ensure that the people in the ashore infrastructure of the Navy are able to perform their jobs more efficiently to support the warfighter.

CHIPS: Four out of five of the commands that you named to receive the program first are acquisition commands. Is there a particular reason why they are receiving the ERP first?

Rosenthal: The Chief Financial Officers Act of the early 1990s served to drive all government agencies to clean up their finances. Our program's major initial focus is to get the financial backbone in place. During the next increment, we will deploy to the supply community — NAVSUP headquarters, Naval Inventory Control Points, the Fleet and Industrial Supply Centers and then move to maintenance — the FRCs and the RMCs.

CHIPS: Will there be training for users?

Rosenthal: Yes. We have spent a lot of time making sure the training is thorough and complete. We will also spend considerable time training the trainers, who will be people from the local organizations where the system is being installed.

Local authorities are ready resources, are trusted by their co-workers, can provide immediate help when questions arise rather than going through a national help desk or another impersonal process, and are right on the ground with them.

Keen: As Ron mentioned earlier in his answer to the first question, we are providing standardized business processes and are bringing in best practices as we train Navy personnel — whether they are military members, civil servants or contractor support.

Through training and using this solution, they are enabled to perform their function in the command where they are sitting the day ERP arrives. They will be able to use it as well wherever they move in their careers, using the same standard processes and the same supporting system. They will become more and more adept at the performance of their business processes, regardless of where their command assignment may take them.

This is a tremendous benefit Navy ERP provides the Navy workforce.

Rosenthal: Every systems command will use exactly the same solution and exactly the same process. If someone transfers from one systems center to another, from one warfare center to another, or from one command to another, he or she will always use the same business rules, toolsets and processes.

CHIPS: Can you discuss the ERP technology? Is it Web-based? Does it interface with any other systems within the Navy or DoD?

Keen: As Ron described earlier, we will be utilizing SAP as our core product for the solution. It is commercial, off-the-shelf — you've probably seen the acronym COTS — software. Our solution, based on the SAP ECC 5.0 software, uses the NetWeaver technology stack, which is part of the product suite offering of SAP; and it takes advantage of Web technologies.

The login will be to a Citrix client or to an HTML version of the graphical user interface. What that means is that as folks are sitting at their NMCI workstation, they will go into SAP — into Navy ERP — via a portal and execute their transactions from there. So, it's appropriate to call the system Web-based. Users get into the SAP system and execute transactions via the portal.

A very important aspect of our solution is that this system operates on NMCI. As you know, that's been a very important initiative for the Navy. And in my view, this is the culmination of the NMCI vision, which is really to be that standard enterprise infrastructure on which enterprise applications can ride. NMCI also provides us with a properly secure environment upon which to provide this enterprise capability.

Navy ERP brings NMCI to an important milestone — enabling the implementation of an enterprise information system. To be clear, we could not implement this comprehensive Navy-wide system without the NMCI infrastructure.

You asked about interfaces. In this first increment of capability, we will be interfacing with 49 systems, 12 of those are DoD financial systems. Other systems with which Navy ERP will interface are systems like the Defense Travel System, the Defense Civilian Personnel Data System (DCPDS) and the existing supply systems. Over time as we expand our solution, Navy ERP will replace some of these systems.

CHIPS: Does Navy ERP replace legacy applications?

Keen: Yes. Navy ERP will replace a significant number of legacy applications. As we work with commands, we talk with them specifically about the applications that will be replaced as they learn the essentials about the functionality that the solution delivers. The Navy's Functional Area Managers (FAMs) are tasked with reviewing and determining which systems are to be replaced, and so our legacy system sunset plan is part of their plan. Right now, we're at more than 300 legacy systems that we anticipate replacing with Navy ERP.

CHIPS: Replacing 300 legacy systems will be a major transformation for the Navy.

Rosenthal: First, our Navy, indeed our whole military, is being asked to transform the way they accomplish their mission. Our troops are using technology in different ways than ever before, are organizing in new and different ways, and are being required to be more efficient and more effective at the same time. Those warfighters are the people the business side of the Navy supports.

On the business side, and I also call it the support side, we have an obligation to be as technologically advanced as we ask the warfighters to be, to organize to be agile in new and innovative ways to better support them, and to be as effective and efficient. Support for a transformed warfighting force must be provided by business systems that are also transformed. Navy ERP propels that transformation in Navy business affairs.

Secondly, many people and organizations use the word transformation. To put transformation into the proper perspective, I would share with you a quote I saw from Secretary of Defense Rumsfeld about business transformation.

'It is not, in the end, about business practices, nor is it the goal to improve figures on the bottom line. It's about the security of the United States of America. And let there be no mistake, it is a matter of life and death. Our job is defending America, and if we cannot change the way we do business, then we cannot do our job well, and we must.' That really sums it up.

Keen: I have been working in Navy IT, Navy information technology, for 28 years as a civil servant. This is the most important business transformation initiative based on IT that I have ever been part of. It's really an exciting program that will make a difference to our Navy and how we support the warfighter.

Rosenthal: Both Susan and I volunteered to do this because of the opportunity. The Navy ERP Program is probably the biggest challenge that either of us has undertaken. We consider it a privilege and an honor to serve the Navy in the delivery of this solution.

For more information about Navy ERP go to: http://www.erp.navy. mil/. To view Mr. Rosenthal's and Ms. Keen's biographies go to the Navy ERP Web site at http://www.erp.navy.mil and click on "Executive Bios."   **CHIPS**

OMB Provides Updated Guidance for Reporting Incidents Involving Privacy Breaches

By the DON CIO Information Assurance Team

With recent reports of potential violations of sensitive personal information by federal agencies, the Office of Management and Budget (OMB) has tightened requirements for safeguarding information assets and for notification of security breaches.

Incidents Involving Personally Identifiable Information
The Federal Information Security Management Act (FISMA) requires all agencies to report security incidents involving personally identifiable information to the U.S. Computer Emergency Readiness Team (US-CERT), a federal incident response center located within the Department of Homeland Security. Personally identifiable information means any information about an individual maintained by an agency, including, but not limited to: education, financial transactions, medical history, and criminal or employment history, and information which can be used to distinguish or trace an individual's identity, such as name, Social Security Number, date and place of birth, mother's maiden name, biometric records, etc., including any other personal information which is linked or linkable to an individual.

Reporting Requirements
In a memo dated July 12, 2006, OMB provided updated guidance on the reporting of security incidents to now require agencies to report all incidents involving personally identifiable information to US-CERT within one hour of discovering the incident. The memo further stipulates that agencies should not distinguish between confirmed and suspected breaches, but to report all incidents, in both electronic and physical form. See the US-CERT Web site at http://www.us-cert.gov/federal/reportingRequirements.html for federal incident reporting guidelines. The Department of the Navy Chief Information Officer (DON CIO) is preparing to release additional guidance that will assist local commands with the specific processes for effectively handling privacy incidents.

Safeguarding Information
Earlier OMB guidance on agency compliance with FISMA called on all agencies to properly safeguard their information assets using a checklist developed by the National Institute for Standards and Technology (NIST). It calls for agencies to follow four steps: (1) Confirm identification of personally identifiable information protection needs; (2) Verify adequacy of organizational policy; (3) Implement protections for personally identifiable information being transported and/or stored off-site; and (4) Implement protections for remote access to personally identifiable information.

Taking these precautions should eliminate the need for reporting later.

The DON CIO is working to improve privacy protections for all DON information technology (IT) resources, collaborating with system owners throughout the Department to perform Privacy Impact Assessments (PIAs) on all relevant IT systems that handle personally identifiable information on DON military and civilian personnel. These PIAs, required by FISMA and DON CIO policy, provide a method for effectively measuring and analyzing the privacy protections in place throughout the Department. The DON CIO is also preparing to release revised policies regarding teleworking, remote access and data at rest that will include language outlining privacy protection requirements.

Contact DON CIO IA team member Darin Dropinski at darin.dropinski@navy. mil for more information.   **CHIPS**

Interview with Rear Admiral Michael C. Bachmann
Commander, Space and Naval Warfare Systems Command

Since February 2006, Rear Adm. Bachmann has focused on four key agenda items. CHIPS asked the admiral to assess SPAWAR's progress in each of these areas, shown below, and respond to how well the SPAWAR Systems Centers are doing in supporting his vision in September 2006.

• Support the Naval NETWAR FORCEnet Enterprise (NNFE) and the Naval Network Warfare Command (NETWARCOM) to more effectively deliver FORCEnet capabilities to the fleet;

• Increase support and strengthen relationships with our program executive offices (PEOs);

• Move Team SPAWAR more toward competency alignment;

• Make Team SPAWAR as efficient and effective as possible.

Rear Adm. Bachmann responding to questions at the SPAWAR PMW 160 off-site in Norfolk, Va.

CHIPS: What capabilities do the SPAWAR Systems Centers bring to the naval fleet and forces?

Rear Adm. Bachmann: In science and technology (S&T) they bring a great skill set. We are working with the Office of Naval Research (ONR) to see if we can obtain more resources to invest in our people and in S&T. Our folks in the labs, both civilians and military, know what the problems are and where the gaps are.

As a result of the last ONR-sponsored Naval S&T Partnership Conference and some other off-sites, we are working with ONR to see if more of the available Navy funding can be aligned to S&T projects that can fill a capability gap for the Navy.

Research and development (R&D) is the other piece. Certainly most of that work is being done in San Diego and Charleston. The other big value I see with the systems centers that probably is not recognized is the teaming of our civilians and military. Charleston saw a need for a more equitable balance of military. We see it in the other three centers. In San Diego there is a good military, civilian, scientist and engineer relationship and that benefits the Navy. It is often overlooked, and it is a powerful paradigm. It benefits not only the fleet but the PEOs and their programs.

Another big piece is the ISEA. Most of the labs have an In-Service Engineering Agent function. The systems centers play a critical role in that area, and I expect that it is going to increase with the Navy's expanding emphasis on distance support as the primary vehicle for assisting the fleet in the future.

CHIPS: Will you reassign military members or request more billets?

Rear Adm. Bachmann: We are going to do a military billet review. It would have to be redistribution. With the recent Base Realignment and Closure we were mandated to establish an Atlantic command. It is going to represent the merger of Charleston and Norfolk. It will facilitate the movement of billets within those two primary systems centers.

Understanding how our valued teammates are employed and documenting their associated deliverables are critical, and we are embarked on that journey with OPNAV N1 at this time. Just recently we discovered that PEO Enterprise Information Systems (PEO EIS), Navy Standard Integrated Personnel System (NSIPS) program office had a fielding group that was disestablished. As a result of cross systems center analysis we were able to temporarily continue fielding support for NSIPS by asking SPAWAR Systems Center Norfolk personnel to support this urgent requirement until more formal support mechanisms can be established.

CHIPS: Is support for the NNFE and NETWARCOM still a priority?

Rear Adm. Bachmann: Yes, and we are marching down the path to fulfill this support. We are totally embedded with NNFE. I am the chief operating officer, Rear Adm. William Rodriguez (SPAWAR Chief Engineer) is cross functional team (CFT-3) lead for modernization, Rear Adm. Timothy Flynn (SPAWAR Vice Commander) is the CFT-2 lead. He has just transferred to become the PEO EIS. Jeff Klein, SPAWAR's installations and logistics lead, has jumped right into those shoes as CFT-2 lead. In every one of these areas we are making primary contributions.

I have advanced some ideas that folks are really jumping on, which will help us help the fleet. Without the NNFE, these are areas we may not have been able to go into because it was out of our lane. That is one of the advantages of working in the enterprise.

An area we are focused on is training a community of combat system officers. We have several different venues under way in parallel. One is the development of a command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) checklist that we will use as our matrix gauge in working with the combat systems officers, the electronics maintenance officers within the carrier strike group (CSG) and the expeditionary strike group (ESG) over the Fleet Response Plan (FRP).

Team SPAWAR historically has placed most of its attention on installs. But there is much more to support than just the install process. It is a critical linkage that ensures the basic integrated logistics support: the equipment is working, and it is supported properly initially. We have to work hand-in-hand with the CSGs and ESGs over the FRP cycle. We have to remove variability in how they train, man and equip their respective ships to support C4I systems. Otherwise, we will run into the same thing I have seen in the seven

months I have been here: every time a CSG or ESG comes back they have significant issues with their C4ISR systems.

The only way we are going to change that is by working with the fleet one-on-one through the FRP to make sure they recognize that we are here, that we are an 'umbilical cord.' They can reach out to us through single points of contact. We can work the system enterprise to serve them, whether it is in manpower, personnel or training and education of their enlisted and officer corps.

I want to see a repository for each CSG and ESG on their C4ISR preparedness over the FRP cycle. When we sit down as an enterprise at a debriefing, we can understand how successful we were in supporting them. Not just in crisis response over the cruise, but ensuring that their enlisted and their officers were at peak performance, and that they understood the systems and knew who to phone or send an e-mail to.

The second part is establishing readiness officers who are assigned to CSGs and ESGs. We are going through that process with Rear Adm. Rodriguez as the CFT lead. Those two things — the checklist and assigning readiness officers — will help us develop metrics that we can track for each of those deployers and use that as our interface with the Naval Aviation Enterprise, the Surface Warfare Enterprise and the Undersea Warfare Enterprise.

We have seen significant correlations between CSGs that have a higher emphasis on training. They appear to do better. We need to bring the readiness officers up to the same level and remove the variability that exists now in the maintenance and operations of C4ISR systems. One of my primary responsibilities to the Chief of Naval Operations (CNO) is sustainability. We need razor focus from our PEOs and program offices on sustainment. We are supporting NNFE directly — and we are going to positively impact the fleet.

CFT-1 has done great work on their FORCEnet Capability Development Plan. We have a face-to-face this week and the FORCEnet Capability Development Plan will be reviewed. The folks put a lot of effort into it and it shows the requirements piece. How do we identify gaps? How does the fleet get them into a central repository? Where are the areas we need to focus on, and how do we use the POM process to address those shortfalls?

It encapsulates everything from experimentation to respective PEO/program office budgets that need to be influenced to satisfy or remove those gaps. Our support in the NNFE is paying dividends for both Team SPAWAR and the fleet. We have a way to go, but we have good people focused on improving operations.

CHIPS: Can you comment on increasing support for the PEOs?

Rear Adm. Bachmann: That includes JPEO JTRS, Joint Program Executive Officer Joint Tactical Radio System. We have already made sure we are providing him with the best support possible in contracting, financial and legal support. JTRS is a critical program for the Navy.

We have great relationships with PEO C4I, PEO Space Systems, JPEO JTRS and PEO EIS. As we migrate to competency-aligned organizations, the purpose is to make sure we are growing the talent that the PEOs need and then matrix those into the associated PEOs.

We have a POA&M, a Plan of Action and Milestones and timeline. It is fortuitous since Assistant Secretary of the Navy for Research, Development and Acquisition Dr. Delores Etter recently directed all systems commands and PEOs to move to this construct. We are already on that course and have a POA&M that we can provide to her by Oct. 15. We are going to extend it to the folks who are matrixing to the PEOs and possibly even one step further to the NNFE.

CHIPS: What progress is there in making Team SPAWAR as competent, efficient and effective as possible?

Rear Adm. Bachmann: We have aligned Balanced Scorecards across the systems centers and with headquarters. We took the NNFE goals and contrasted them with Team SPAWAR's goals to make sure we were in alignment with the enterprise. Lean Six Sigma efforts are in high gear. By fall, we project we will have 72 black belts and 400 or more green belts.

I recently attended the Secretary of the Navy and the CNO Lean Six Sigma kickoff for the Navy. Team SPAWAR is already embarked on this journey and is making great progress toward creating a more efficient and effective organization. Lean Six Sigma is now a Navy primary focus area with mandates for POA&Ms within each of the systems commands. We brought Bob Kaminski, a black belt, on board and he is doing a stellar job with our teams and with the assistant secretary of the Navy's staff. These programs team-wide are going to make us more efficient.

It is important that as we gain efficiencies that we also invest in our people and provide them with the tools that are going to make the team stronger. We should be focused on the new technologies that are emerging like service-oriented architectures and permitting them to go to school to get advanced degrees. This is all a part of diversity and a focus on our people because they are our real resource. As we go into Program Review 09, we are working closely with OPNAV N1 Manpower, Personnel, Training and Education to look at our total force readiness. This includes our civilian workforce, military and contractor support services.

I am impressed with Team SPAWAR. SPAWAR Comptroller Steve Dunn and Tim Dowd and our contracting organization have done a superb job of documenting what our people do through our own reporting mechanisms. They have taken the time and attendance tool and mapped it against the work breakdown structure to show how our people are employed.

We owe it to the Department of the Navy to show how we apply our resources on behalf of the Navy for each of those three categories — military, civil service and contractor support services. When I came to SPAWAR, I wanted to make sure that we would map our accomplishments in these areas using the Malcolm Baldrige criteria. We expend a lot of resources and a lot of effort in these areas — and we should be rewarded for that.

If you look at the Balanced Scorecard — people, customer, processes and financial resources — those are the same components that are integral to the Malcolm Baldrige criteria. That should be a long-term goal. I may not see it on my watch, but I want Team SPAWAR, our PEOs, systems centers and headquarters to be recognized for the skilled professional group that they are. CHIPS

Technology and Systems Drive DoD Business Transformation

By U.S. Army Maj. Gen. Carlos "Butch" Pair

"It is not, in the end, about business practices, nor is the goal to improve figures on the bottom line. It's really about the security of the United States of America. And let there be no mistake, it is a matter of life and death. Our job is defending America, and if we cannot change the way we do business, then we cannot do our job well, and we must."

– U.S. Secretary of Defense Donald H. Rumsfeld
Sept. 10, 2001

A Fundamentally Different DoD Business Model

The purpose of Department of Defense business operations is to rapidly deliver the right capabilities, resources and materiel to our warfighters: What they need, where they need it, when they need it, anywhere in the world.

Given the size of the DoD, this is a difficult enough task when the operating environment consists of sustained, conventional battlefield engagements in predictable parts of world. However, the DoD is deployed in 130 countries throughout the world, with operations as diverse as helping the people of Iraq to build their own defense force and establish a representative government, to providing recovery operations for tsunami relief and Hurricane Katrina.

The new reality of DoD's complex military operations has given increased urgency to transforming the Department's business operations. DoD is meeting this challenge with unparalleled energy and focus to confront inherited assumptions and cherished ways of doing business and to seek out better approaches to providing support for our warfighters.

In October 2005, the deputy secretary of Defense established the Business Transformation Agency (BTA) as the entity to manage and execute DoD enterprise-level requirements. The rapid inception of the BTA reflects the urgency for DoD business transformation and an acknowledgement that certain capabilities are needed at the corporate enterprise level to support the joint warfighter and senior DoD decision makers. These capabilities are enabled through enterprise data standards, reliable information sources, and a portfolio of interoperable systems to improve efficiency and effectiveness.

There are seven directorates that make up the BTA. The **Enterprise Integration Directorate** is responsible for supporting the integration of enterprise-level business capabilities such as Enterprise Resource Planning (ERP) systems, and how they should be implemented across complex organizational boundaries to support the joint warfighter.

The **Transformation Planning and Performance Directorate** facilitates maximum resource utilization and increased performance within the BTA's time, cost and performance constraints.

The **Transformation Priorities and Requirements Directorate** is the primary link to the Principal Staff Assistants (functional business requirement owners) within the Office of the Secretary of Defense (OSD), as well as other DoD-level organizations including the U.S. Transportation Command, the Defense Logistics Agency (DLA) and the Defense Finance and Accounting Service (DFAS).

The Scale of DoD Business Transformation

The Department of Defense is the largest agency in the federal government. Department leaders know that sound financial management is essential to a wise use of DoD resources. The Department owns 86 percent of the government's assets. It employs 1.4 million active duty men and women, 740,000 civilians, 820,000 guard and reserves, and pays benefits to 2 million retirees and families.

In addition, the Department operates in more than 130 countries using more than 600,000 buildings and structures.

Managing an organization with resources of this magnitude demands sound and reliable business and technology management practices and systems.

DoD Compared to Industry

· DoD budget is $200 billion larger than Wal-Mart's revenue, the largest Fortune 500 Company.

· DoD assets and liabilities are more than the combined assets and liabilities of Wal-Mart, Exxon, Ford and IBM.

It ensures that the functional priorities and requirements of these client organizations are reflected in both the Business Enterprise Architecture and the Enterprise Transition Plan, and in the guidance for business system investment management.

The **Investment Management Directorate** provides leadership in investment management for DoD Enterprise-level business systems, coordinates the efforts of the DoD 5000 series as it pertains to business systems, and provides BTA input for the Quadrennial Defense Review (QDR). The **Warfighter Support Office** addresses immediate business process and business system challenges that adversely impact current operations. WSO delivers near-term value by connecting the DoD's business mission to the warfighter, and identifying and addressing frontline opportunities.

Agency Operations provides centralized support across the Business Transformation Agency. This support enables the directorates to complete their individual missions, contributing to the overall transformation mission of the Agency. The Defense Business Systems Acquisition Executive (DBSAE) is a flag officer or equivalent Senior Executive Service (SES) position.

"The modernization of the Department of Defense is a matter of some urgency. In fact, it could be said that it's a matter of life and death, ultimately, every American's."

— **U.S. Secretary of Defense Donald H. Rumsfeld**

This directorate includes the DBSAE and his or her supporting staff and is responsible for driving the successful implementation of DoD systems and initiatives in support of the Department's Business Transformation goals.

In support of the Department's transformation goals, the agency has established four strategic objectives. The BTA pledges to: (1) Support the joint warfighter; (2) Enable rapid access to information for strategic decisions; (3) Reduce the cost of defense business operations; and (4) Improve financial stewardship to the American people.

Improving Agility and Accountability

The Department has made significant strides in breaking down the legacy cultural and systems barriers that hamstring business agility. The current climate of making continuous improvements every six months to benefit the warfighter has succeeded in driving progress at an unprecedented rate.

Through the leadership of the Defense Business Systems Management Committee (DBSMC), DoD now has a tighter alignment of end-to-end business functions, better management visibility into operations, and a noticeable bias toward execution excellence.

Governance and a Portfolio View

An important activity related to defense enterprise integration is the migration of IT systems from across DoD into a common portfolio of business enterprise programs. These enterprise programs will provide enhanced visibility, advocacy, and direct accountability to senior leadership and enable focused implementation of DoD enterprise business capabilities. The deputy secretary established the DBSAE to be accountable for the delivery of these enterprise-level business systems.

Beginning October 2006, the DBSAE will have organized to be able to deliver the needed capabilities of 25 assigned programs. Key to this is the recognition that governance at the senior-level was absent. The Defense Integrated Military Human Resources System (DIMHRS) and the Defense Travel System (DTS) now benefit from 08-level Enterprise Steering Groups. Next is a governance body for sourcing and later financial visibility.

Each program will be assigned to a program executive officer that will not only look at each program individually but also as a family of systems. The expected benefits of the portfolio view will allow the Department to gain from portfolio strategies in the areas of funding, hosting, security and schedule synchronization, as an example.

Key DBSAE Programs

Acquisition Spend Analysis Service (ASAS)

The DoD procures more than $200 billion in goods and services annually. Prior to providing an enterprise-level solution, inefficient processes and lack of data resulted in fragmented and redundant buying strategies, misguided purchase decisions, and missed opportunities for cost savings.

The Acquisition Spend Analysis Service provides the enterprise-level solution to acquisition analysis, pulling data from multiple services into a single point for review, reducing the complexity of data integration across the Department. ASAS provides insight into buying patterns to support the most efficient sourcing strategies for the warfighter and offers the ability to look for opportunities to leverage purchasing across the military services and agencies. It also provides a tool for trend analysis and compliance checks, resulting in more informed decision-making across the DoD.

Contractor Performance Assessment and Reporting System

CPARS is a Web-enabled application that collects and manages the library of automated Contractor Performance Assessment Reports, which measure contract execution and provide a record, both positive and negative, for contracts. The system allows the storage of assessment reports along with supporting program and contract management data, such as cost performance reports, customer comments, quality reviews, technical interchange meetings, financial solvency assessments, construction/production management reviews, contractor operations reviews, functional performance evaluations, and earned contract incentives.

CPARS is now being used by all supply centers throughout DLA and the military services.

Defense Business Sourcing Environment (DBSE)

DBSE will provide the DoD enterprise a standard and automated end-to-end sourcing capability by which supplies and services are acquired in support of the warfighter. DBSE will provide the common core enterprise service for DoD sourcing and enable a Common Supplier Engagement Model from requisition to payment by delivering an integrated suite of new and existing DoD-wide capabilities.

Defense Integrated Military Human Resources System

DIMHRS will provide an end-to-end, integrated military personnel and pay system for the military services, including their active, Reserve and National Guard components. DIMHRS is a transformational technological effort that seeks to provide integrated personnel and pay functions, offers accurate and timely data on personnel assets, tracks Reservists for both pay and service credit, traces all military personnel in and around a given forward deployed theater, and offers standard data for comparison across the services and components.

DIMHRS implementation will result in significant improvements in the ability of the military services to account for and manage human resources. However, obtaining the full potential of DIMHRS will require that capabilities are closely aligned with service needs through the frequent and ongoing involvement of the military services in the definition, development, and deployment of those capabilities.

The DBSAE Putting Technology to Work: DTS

The Vision: Reengineer defense travel to a seamless, paperless, automated system that meets the needs of individual travelers, force commanders, and process owners, such as finance and accounting services. The new system will support defense mission requirements, provide superior customer service to the traveler and to the command, and reduce costs to the government.

The Reality: For the 3.5 million active duty military, Reserve and civilian employees of the Department of Defense, travel has often been a notoriously long and difficult process. However, it is not anymore.

DTS represents a whole new way of doing business for government. It delivers real, measurable results as proven in pilot tests. DTS makes the travel process faster, easier and better than ever before. DTS seamlessly automates the three DoD travel processes: authorization, reservation and voucher filing.

Using DTS, travelers are able to generate travel authorizations, make trip reservations, and route travel requests for approval, all from their desktop workstation. The system is paperless and uses DoD Public Key Infrastructure (PKI) certificates for digital signatures, as required.

The Deployment: DTS is totally Web-based. There is no need to load any software on the workstation other than a Web browser plug-in for digital signature authentication and system security. When the trip is complete, the traveler can quickly create a voucher from the data already stored in the DTS system, and then electronically route it for approval and submission to DFAS.

An electronic funds transfer from DFAS to the traveler's bank account completes the process. Finally, the traveler is able to scan or fax required receipts, which are attached to the individual's travel voucher for electronic archival upon completion of the process.

Easy Accessibility at all Levels: DTS is based on commercial-off-the-shelf software and leverages the Defense Information Infrastructure. Thus, users enjoy multiple ways to access the Defense Travel System, ranging from Web browsers to client/server access to character-based environments. Users who are not yet automated can take full advantage of DTS through their commercial travel office contractor via phone and fax.

Real Time Information for Users: Real-time availability and booking capability are built into the DTS to provide easy access to commercial travel service providers. Travelers can instantly check databanks of information on hotel, airline and car rental availability.

Scalable to Meet Tomorrow's Needs: DTS is based on a clustered multiprocessing environment with modular systems for maximum flexibility. With this configuration, it's easy to add processors, memory and functionality based on customer needs. Because of the client/server architecture, DTS users gain better presentation of information along with greater flexibility during interaction.

Optimized for database environments, DTS features powerful servers and software products that provide the exceptional reliability and efficiency required to meet DoD's high volume of transactions and query-intensive applications.

Built-in Supportability for Exceptional Service: The DTS team has established the first Central Data Center in Fairfax, Va., to operate DTS. This data center is configured to provide highly reliable, responsive data services while ensuring data integrity with minimal administrative burden. A help desk based in Fairfax will provide anytime, anywhere support to users. A second data center will soon be up and running in Annapolis, Md., and will further enhance the reliability, responsiveness and integrity of electronic data services with minimum administration.

Full-Scale Security Ensures Integrity: Stringent control of system data and resources is built into DTS, and the DTS team delivers a command and control level of trust via the system's security. Secure gateways and other security controls in the data center provide identification and authentication of users, control access to specific data records, and prevent the unauthorized disclosure and dissemination of DoD travel data. All internal resources of the system — computers, networks and data — are fully protected from external attack.

DTS, which is compliant with all privacy act requirements, protects travel documents and personal profile information by allowing the Defense Travel Administrator (DTA) to limit traveler and Authorizing Official (AO) access. Travelers only have access to personal profile information on a need-to-know basis determined by the DTA. AOs only have access to travel documents for those travelers for whom they are responsible.

The challenges facing the DoD fall into three broad categories: those that heavily depend on systems solutions; those that depend primarily on process solutions; and those that depend on both systems and process solutions. With the DBSAE acting as an oversight to programs, which address all three of these categories, the BTA will continue to make significant strides toward improving the DoD and guiding business transformation efforts.

The DBSAE programs and systems will provide DoD with transformation tools to assist in transitioning to a future information infrastructure that will provide flexible and responsive business and financial support to the warfighter and senior decision makers.

Additional information on the BTA or DBSAE programs can be found at http://www.dod.mil/bta.

Maj. Gen. Carlos "Butch" Pair is the Defense Business Systems Acquisition Executive. As DBSAE, he is responsible for driving the successful implementation of the DoD Business Enterprise systems and initiatives in support of the Department's business transformation goals. He exercises acquisition oversight for highly visible enterprise-level business systems assigned by the Defense Business Systems Management Committee (DBSMC). Go to http://www.dod.mil/bta/ldr_pair.html for Maj. Gen. Pair's biography. **CHIPS**

The Common PC Operating System Environment Program – COMPOSE

The Navy's Networks, Information Assurance and Enterprise Services Program Office, PMW 160, provides the network fabric and services used by multiple shipboard tactical and business applications and systems. It also provides a common network infrastructure across multiple security domains and supports cross-domain and coalition operations.

PMW 160 is located in San Diego, Calif., and reports to the Navy's Program Executive Office for Command, Control, Communications, Computers and Intelligence (PEO C4I).

The Common PC Operating System Environment (COMPOSE) combines commercial-off-the-shelf (COTS) and government-off-the-shelf (GOTS) products to deliver directory services, e-mail, Web acceleration, office automation applications, collaboration tools and antivirus software for the Integrated Shipboard Network System (ISNS), Combined Enterprise Regional Information Exchange System (CENTRIXS), Sensitive Compartmented Information (SCI) networks, and Submarine Local Area Network (SubLAN).

COMPOSE delivers these services to the warfighter in a secure software bundle that aligns to the latest Defense Information Systems Agency (DISA) standards and guidelines. Typically delivered to the fleet in conjunction with a corresponding hardware refresh, COMPOSE is a key software component in the IT-21 vision for modernizing afloat networks.

COMPOSE, managed by PMW 160's Future Enterprise Networking Division, fulfills the fleet's requirement for a common, standardized client/server operating system. Its predecessor, GOTS Delta, was built on the Windows NT architecture and defined as the standard by the IT-21 initiative. It was the first version of PMW 160 baseline software fielded to the fleet.

Fielding for COMPOSE 2.0.3 began in April 2004. It introduced the Windows 2000 Server architecture into the fleet. It has been part of PMW 160's solution to the risk posed by Windows NT End-of-Life (EOL) and, as the first COMPOSE load, marked the beginning of a steady and deliberate progression away from GOTS toward COTS solutions. The security posture for this version of COMPOSE was built to the DISA Gold Standard — the standard at that time.

The latest version of COMPOSE is based on the Windows 2003 Server architecture, which supports Windows 2000 and XP client workstations. COMPOSE 3.0.0 development was accelerated in response to the urgent need to resolve the Windows NT EOL crisis per direction from the Naval Network Warfare Command (NETWARCOM) and the Department of the Navy Chief Information Officer.

PMW 160 obtained authorization to begin aggressively fielding this version of COMPOSE in February 2006 and conducted its first shipboard installation aboard the USS Antietam (CG 54) in March 2006. COMPOSE 3.0.0 was designed to meet DISA Platinum Security Technical Implementation Guidelines (STIG).

COMPOSE 2.0.3 has been fielded on more than 130 platforms, and version 3.0.0 has been fielded on more than 70 platforms. As an-

ticipated, the most significant issue has been compatibility with applications that have not yet demonstrated interoperability with Windows 2003 Server and XP or have not yet aligned with the DISA Platinum STIG. While NETWARCOM and Commander Operational Test and Evaluation Force have mandated that application sponsor/owners are responsible for verifying compatibility with COMPOSE 3.0.0, it is PMW 160's responsibility to proactively track and publicize known application compatibility issues as they arise.

Along with a discussion on application compatibility during installation in-briefs, PMW 160 uses the Preferred Product List/System/ Subsystem Interface List (PPL/SSIL) and the Critical and Non-Critical Application List to communicate these issues Navy-wide.

Typically, applications/systems that are included on the PPL/SSIL should not present unknown interoperability issues when installed in the COMPOSE environment that they were tested against.

Current status on all reported compatibility issues is provided in the Critical and Non-Critical Application List, which is updated on a weekly basis. These lists are available via the Naval Networks Web site at https://navalnetworks.spawar.navy.mil.

There are new builds planned for fiscal years 2007 and 2008, including COMPOSE 2.0.4, 3.0.1 and 3.1.0. Versions 2.0.4 and 3.0.1 will provide security updates, COTS service packs, and COTS application EOL updates. The security updates incorporated into version 2.0.3 will change its security standard from DISA Gold to Platinum.

COMPOSE 3.1.0 will leverage a COTS solution for software distribution and introduce Microsoft Vista Client software into the fleet to stay a step ahead of Windows XP EOL. PMW 160 is proactively working with Microsoft to test the beta version of Vista, Microsoft's next operating system against the current COMPOSE baseline.

The introduction of Vista will further enhance COMPOSE security because Microsoft is collaborating with DISA to define its default security settings for the new client software.

COMPOSE 3.1.0 will be designed to support fielding of DMS Proxy and information assurance tools such as Online Certificate Status Protocol (OCSP), Secure Configuration Compliance Validation Initiative (SSCVI), and Secure Compliance Remediation Initiative (SCRI).

Support for these information assurance tools is critical in helping the fleet meet mandated changes to the afloat environment, such as implementation of Public Key Infrastructure (PKI) /Cryptographic Log On Afloat (CLO).

COMPOSE 3.0.0 has paved the way for afloat networks to mitigate risks associated with Windows NT and Windows 2000 EOL, as well as to provide the warfighter with the latest software available.

Working closely with stakeholders, installers, engineers, and fleet representatives, PMW 160 and the COMPOSE Program Office are delivering robust capabilities to the fleet in a timely, cost effective manner. **CHIPS**

Welcome to the Major Leagues

By Sharon Anderson

It was a brand new ball game for U.S. Second Fleet operations. For the first time three carrier strike groups operated together under one umbrella during Joint Task Force Exercise (JTFEX) 06-2 "Operation Bold Step." With more than 16,000 service members and 13 ships, the exercise, conducted July 21-31, 2006, closely replicated operations that military forces routinely perform around the world.

JTFEX 06-2 served as the forward-certifying event for the Dwight D. Eisenhower Carrier Strike Group (IKE CSG) and sustainment training for units from the Theodore Roosevelt CSG (TR CSG) and Bataan Expeditionary Strike Group (BAT ESG). JTFEX 06-2 also served as a significant training milestone toward Second Fleet's staff certification as a Joint Task Force (JTF) headquarters planned for 2007.

The Second Fleet staff conducted assessment, planning and execution functions with the support of U.S. Joint Forces Command, U.S. Northern Command, Coast Guard Atlantic Area, the State Department and others.

U.S. and coalition naval assets underway for the exercise included the Second Fleet flagship, USS Wasp (LHD-1), with embarked Second Fleet distributed staff, the aircraft carriers, USS Dwight D. Eisenhower (CVN 69) and USS Theodore Roosevelt (CVN 71), with associated units, and units from the USS Bataan Expeditionary Strike Group.

I Like Ike

Aboard the Eisenhower, it's easy to get caught up in the ship's rhythm. The Eisenhower and its crew — more that 6,000 of them including the air wing — are impressive. The Eisenhower is as long as the Empire State Building is tall — 1,092 feet from bow to stern. Fully loaded, it displaces almost 100,000 tons of water.

The flight deck is 4.5 acres of sovereign U.S. territory that can sail unchallenged throughout the world. Eisenhower has four massive aircraft elevators and four catapults under almost constant operation. The engine repair shop on board can change out a jet engine in less than an hour.

On the "Ike" exercise execution was fast-paced and exciting with action continuing round the clock as battle watchstanders responded to a variety of operational drills and simulated events. Although the exercise involved fictitious events, operational response from crew members was seriously focused. Most of the activity seemed to be centered in flight operations and in the command, control, communications, computers, combat systems and information (C5I) spaces.

Ship's Time

The Ike has 2,500 NIPRNET and 600 SIPRNET drops engaged continuously in warfighting communications. The combat systems information officer, Lt. Cmdr. Richard Menard said he is so busy in C5I that he averages a few hours sleep per night. "When the ship is deployed, I don't even wear a watch. It doesn't matter what time it is, there is only ship's time."

Training less experienced crew members and maintaining critical communications systems are a high priority for the Eisenhower and strike group. Crew training is important because the average age of a crew member is between 20 and 21-years-old, and according to Menard, 80 percent of the crew had never completed a work-up cycle, which the Eisenhower just finished.

"It's like that on any ship. That's why we train. All of the officers in combat systems are 'mustangs,' officers with prior enlisted service. We understand what duty is like for enlisted personnel on a carrier. By 2011, the Sailors we are training now will be the leaders on their ships."

Menard said that today's young Sailors have a good understanding of Web-based technologies before they enter the Navy. So he emphasizes training in radio frequencies and spectrum management. The C5I staff is a first-class manager of both bandwidth and radio frequencies. This is essential because robust communications are the lifeline of military operations. Most of the combat systems are high-frequency driven, according to Menard.

"We also train in basic and advance fleet communications, which encompasses both voice and data systems using the latest technology, but we must never forget the old ways of communications, high frequency (HF) and spectrum management. This is becoming a lost art and very few of us old timers (radioman) are left. We must continue to train our Sailors in all aspects of communications, new and old, to fully support the fleet," Menard said.

C5I keeps IT-21 and the COMPOSE networks up and running.

Aboard the USS Eisenhower (CVN 69) during Joint Task Force Exercise (JTFEX) 06-2 "Operation Bold Step" - On a tour of C5I spaces, Ensign Truitt Smith explains the advanced technologies and systems used for naval communications. Far right - Lt. Cmdr. Richard Menard (standing) and Cmdr. James Boozer coordinate C5I planning for Operation Bold Step communications with the carrier strike groups, coalition and interagency participants.

COMPOSE, or Common PC Operating System Environment, is the new shipboard network (encompassing servers and personal computer clients) that the Program Executive Office for Command, Control, Communications, Computers and Intelligence (PEO C4I) PMW 160 is fielding to replace the IT-21 afloat system. *(See page 33.)*

In many ways, COMPOSE is the Navy's afloat version of the Navy Marine Corps Intranet. Although the NMCI is not installed on ships, the air wing and destroyer squadrons use NMCI "embarkables" or laptops, which C5I sets up for the air wing aboard the Eisenhower.

C5I

Combat systems personnel provided multifaceted communications support to the entire strike force, which included three "big decks" — the Teddy Roosevelt, Eisenhower and the amphibious assault ship, USS Bataan (LHD 5).

On a tour of the communications spaces, referred to as "MAIN COMMS" or "RADIO," Ensign Truitt Smith, radio officer and Electronic Key Management System manager, explained that C5I personnel are trained to troubleshoot problems on all of the systems. "We don't separate jobs; everyone in here knows both sides — tech control and naval messaging."

The state-of-the art, pristine environment houses links for SIPRNET and NIPRNET; the Joint Worldwide Intelligence Communications System (JWICS) and other datalinks for intelligence; the Tomahawk missile system; Global Positioning System; CNN feeds; multilevel chat; imagery networks; voice nets; warfare collaboration tools; and much more.

Maintaining a technology edge is fundamental to decisive military action, and according to Smith, the devices, systems and networks are continuously being improved. "Next year, everything you see here will be replaced with something better."

According to Menard, although the communications requirements were complex — involving air, surface and subsurface operations — the systems and networks operated as planned during the exercise.

"Rear Adm. Allen Myers (Commander, Carrier Strike Group 8 and Commander, Dwight D. Eisenhower Carrier Strike Group) has a very good understanding of C4 systems and technology, which makes our jobs easier," Menard said.

Planning and coordination were the chief reasons why C5I responded effectively to the demand for real-time, flexible, reliable communications to link participants in the exercise. The C5I staff staged about 90 video teleconferences during the exercise, often with very short notice, according to Cmdr. William Boozer, the "N6" and assistant chief of staff for C5I.

"The exercise has been challenging for the C5I organization because this is the first time that the expeditionary strike force has come together in an environment like this. We have never operated with three strike groups under one umbrella. My role in this as the ESF N6, the person responsible for those C5I functions, was challenging because of the large number of players."

"A typical day consisted of making sure all of the warfare commanders' voice nets were up. We established successful communications with our coalition partners including the French submarine, FS Émeraude. We were able to satisfactorily communicate with them via voice and Battle Force E-mail, which is used for our NATO coalition partners," Boozer said. "We worked closely with the LNOs from the other nations, the liaison officers, who worked with us side-by-side."

InfoWorkSpace (IWS), a real-time virtual environment for information sharing, and the Combined Enterprise Regional Information Exchange System (CENTRIXS), a coalition network specially designed to operate under multilevel security requirements, were also used.

Watcherstanders in "MAIN COMMS" responding to simulated threats. Photo courtesy of Mike Gallagher, Airshow Photography.

Lessons learned will be passed on for future communications planning. But several days into the exercise, Boozer e-mailed preliminary reports to his former boss, Naval Network Warfare Command executive assistant, Capt. Michael Maliniak, about the challenges and successes of executing a communications strategy the scope of Operation Bold Step.

"Welcome to the 'Major Leagues,'" Maliniak replied.

Precision Chaos

Each day of the exercise, flight operations typically began about 1300 and concluded at 0200. Carrier Wing 7 commander and air boss Capt. "Bud" Bishop coolly directed operations from the air tower overlooking the flight deck. With more than 70 aircraft on board, including the EA-6B Prowler, F/A-18 Hornet and the EC-2 Hawkeye, there is never a dull moment.

The controlled chaos of flight "ops" is skillfully performed by flight deck personnel who seem to be so in sync with the movement of aircraft that they perform their duties intuitively.

Lt. Chris Wood of the "Pukin Dogs," referred to Bishop as the "CAG" or carrier air wing commander, whose orders are strictly followed by flight operations personnel on deck, as well as in the hangar bay, and air command and control rooms within the ship.

It's hard to believe that anyone could hear anything over the roar of the jet engines, but flight crew members said, "No one misses a word the air boss has to say."

Carrier Wing 7 includes the "Tigertails" of Early Airborne Warning Squadron One Two Five (VAW 125); the Pukin Dogs of Fighter Squadron One Four Three (VF-143); the "Wildcats" of Strike Fighter Squadron One Three One (VFA-131); the "Jolly Rogers" of VFA-103; the "Patriots" of Electronic Attack Squadron One Four Zero (VAQ-140);

the "Rampagers" of VFA-83; the "Nightdippers" of Helicopter Anti-submarine Squadron Five (HS-5); and the "Rampagers" of Fleet Logistics Support Squadron Four Zero (VRC-40).

The E-2C Hawkeye, flown by VAW 125, is the Navy's all-weather, carrier-based tactical battle management airborne early warning, command and control aircraft. The E-2C is a twin engine, five-crew member, high-wing turboprop aircraft with a 24-foot diameter radar rotodome attached to the upper fuselage. An integral component of the carrier strike group air wing, the E-2C uses computerized radar, Identification Friend or Foe, and electronic surveillance sensors to provide early warning, threat analysis against potentially hostile air and surface targets.

Referred to as the "sexiest plane in the Navy" by one of its crew members, the primary mission of the EA-6B Prowler is to support strike aircraft and ground troops by interrupting enemy electronic activity and obtaining tactical electronic intelligence within the combat area. The Prowler holds a pilot and three electronic countermeasures officers.

The F/A-18 Hornet, an all-weather aircraft, is used as an attack aircraft as well as a fighter. In its fighter mode, the F/A-18 is used primarily as a fighter escort and for fleet air defense; in its attack mode, it is used for force projection, interdiction and close and deep air support.

Flight deck temperatures soared above 100 F during the exercise, but the flight deck crew, clad in brightly colored jerseys and safety gear, were undaunted. In response to a question about the exercise, one crew member said, "I know there is an exercise going on, but all I really care about is launch and recovery — making sure the planes launch and return safely."

Atop "vulture's row," Sailors and visitors can get a bird's eye view of flight operations while an SH-60F Seahawk helicopter flies plane guard. On the flight deck, crash and salvage firefighting equipment and personnel are a sober reminder that flight ops personnel work long, dangerous hours.

Inside the ship, flight deck handlers scrutinize the "Ouija Board," a scale model of the flight deck, hangar bay and aircraft on board used for plane placement and flight operations coordination.

Topside, the Military Sealift Command oiler, USNS John Lenthall (T-AO 189), sails alongside the Ike until it's precisely 180 feet from the Eisenhower for an underway refueling. As the Eisenhower's "XO" calls a greeting to the captain and crew of the Lenthall, personnel on deck are already manning lines to position the huge hoses for pumping fuel on board.

Routine shipboard activities go on in addition to exercise operations — brass is shined, equipment is repaired, and the crew rests, eats and works out in the fitness centers. On one such day during the exercise, Menard's promotion to lieutenant commander took place.

"I was pinned by the Commanding Officer Capt. Cloyd and the Command Master Chief of CVW-7, Russell Busby. Master Chief Busby

July 21, 2006 – View from the hangar bay of the USS Eisenhower, Military Sealift Command oiler USNS John Lenthall (T-AO 189) alongside the Eisenhower during an underway refueling.

July 21, 2006 – Aboard the USS Eisenhower flight operations continue sometimes for more than 13 hours a day.

and I have known each other for over 24 years. Back in 1982 he was my sponsor on my first ship, USS Benjamin Stoddert (DDG 22), out of Pearl Harbor, Hawaii. He was a 3rd class petty officer and I was a seaman recruit. We did our first deployment together, and now 25 years later, we are getting ready to do our last deployment together.

Throughout the exercise steadily watching from the bridge, Capt. Dan Cloyd and Executive Officer Capt. Tushar Tembe monitored exercise events, ship operations and flight ops.

Always in the background are the unmistakable voices of the air boss and XO, the hum of the ship's systems and networks, the powerful growl of aircraft on the move — and in the forefront — the ship's crew — valiant and indefatigable.

For more information about the Eisenhower and its crew, go to http://www02.clf.navy.mil/eisenhower/.

Sharon Anderson is the CHIPS senior editor; she can be reached at chips@navy.mil.   CHIPS

They're Back and Better Than Ever

SPAWAR Systems Center New Orleans Welcomes Back Employees

By Maria LoVasco Tolleson, SSC New Orleans Public Affairs Officer

Almost 11 months after being displaced by Hurricane Katrina, Space and Naval Warfare Systems Center (SSC) New Orleans welcomed back its workforce with a ribbon cutting ceremony July 13. About 200 guests attended the ceremony, many of them visitors representing the companies that helped to refurbish the center.

SPAWAR Commander Rear Adm. Michael Bachmann served as the special guest speaker. Other speakers included Dr. Timothy Ryan, Chancellor of the University of New Orleans (UNO) and Mr. Patrick Gibbs, president and CEO of the UNO Foundation, which owns and operates the UNO Research and Technology Park where the center is located on Lake Pontchartrain.

From left to right: State Representative Steve Scalise; Mr. David Mize representing New Orleans Mayor C. Ray Nagin; Chancellor Timothy Ryan; Ms. Priscilla Warsley-Riley representing New Orleans Councilwoman Cynthia Hedge-Morrell; Rear Adm. Michael Bachmann; Capt. Fred J. Mingo; Mr. Patrick Gibbs; Louisiana State Senator Derrick Shepherd.

and other equipment down five flights of stairs in darkened buildings without air conditioning. Temperatures topped 95 F in the blistering heat.

In May 2006, Rear Adm. Bachmann recognized two members of this team, Lt. Lois Tink and Mr. Dwayne Green, as SPAWARRIORS of the Quarter. They also received an award from the New Orleans Federal Executive Board.

Many employees assumed tasks outside of their normal functions to continue to maintain critical Navy pay and personnel systems.

The majority of the workforce sustained personal loss and severe damage to their homes. Many had to deal with hardships and attempt home repairs from hundreds of miles away.

In the aftermath of Hurricane Katrina, almost 800 SSC New Orleans employees scattered to work sites throughout the nation. Sites included Naval Air Station, Pensacola, Fla.; Naval Support Activity Mid-South in Millington, Tenn.; and Naval Air Station Joint Reserve Base, Fort Worth, Texas. The Defense Integrated Military Human Resources System and the Navy Standard Integrated Personnel System, which were collocated with SSC New Orleans, relocated to Arlington, Va.

Although the facility itself was not flooded as a result of the nearby levee breach, the buildings suffered extensive roof damage, which allowed rainwater to get inside the walls of the building causing widespread mold and water damage.

About 80 employees were able to return to the facility in December 2005 to work in office trailers set up in the front parking lot of the damaged buildings. Others returned to work at the Naval Support Activity New Orleans, from Stennis Space Center in Mississippi, and from leased contractor spaces in Luling and Mandeville, two outlying suburbs of the Greater New Orleans area.

In the first week after the hurricane, a small team of SSC New Orleans employees arranged for a helicopter to fly them above the Research Park to assess the damage to the complex. Most of the city still lay underwater and access was impossible.

As soon as the waters began to recede, a damage assessment team, made up of members of the command's Information Technology Department, began to hand-carry hundreds of servers, computers

Still, since those first bleak weeks in September 2005, the single-minded goal of the command's leadership has been to return the workforce to New Orleans.

"This facility reopening is critical to this area," said Chancellor Tim Ryan during the ceremony. "We are here today to celebrate what will be the catalyst for rebuilding this part of New Orleans. It is important to get the jobs and people back in order to rebuild."

Rear Adm. Bachmann first visited the facility in May 2006. When he returned in July for the ribbon cutting ceremony he was astonished at the progress.

"Since my last visit two months ago, I have tried to convey to the rest of the Navy the dire circumstances you are facing. You have done an amazing job dealing with the situation and continuing to provide exceptional service to the Navy," Bachmann said. He echoed Ryan's sentiments regarding the return of the command to work from the refurbished New Orleans facility. "We were always committed to coming back."

Now retired SSC New Orleans Commanding Officer Capt. Fred Mingo praised the can-do spirit of his employees and talked about both the struggle and the resiliency of individuals continuing to exhibit extraordinary professionalism and resourcefulness in an environment of enduring hardship and devastation. "This marks the end of our recovery and the beginning of our next chapter," he said. "As a team, we're unbeatable." **CHIPS**

CAN YOU HEAR ME NOW?

"FREQUENCY" ASKED QUESTIONS

By the DON CIO Telecom/RF Spectrum/Wireless Team

For the past two years *CHIPS* magazine has been running the "Can You Hear Me Now" series of articles about the Department of the Navy's management of the electromagnetic spectrum. Many have followed this series and understand the fundamentals of spectrum. However, once in awhile, it is good to take a step back and look at spectrum from the novice's point of view. This article does just that and presents some frequently or "frequency" asked questions about spectrum.

What is Spectrum?

The electromagnetic spectrum, or "spectrum," is made up of all frequencies of electromagnetic waves. In the 17th century, spectrum referred to the frequencies, or colors, that made up visible light. Lower frequencies of the visible spectrum are red and higher frequencies are blue. By the end of the 19th century, scientists had discovered that the spectrum extended far beyond what we could see — above blue light was ultraviolet and X-rays, and below red light was infrared and radio waves. Gamma rays were finally discovered in the early 20th century, rounding out the electromagnetic spectrum.

Where are radio frequencies in the electromagnetic spectrum?

Radio frequencies are a subset of the larger electromagnetic spectrum. Generally, the frequencies between 3 kHz and 300 GHz are referred to as the "radio frequency (RF) spectrum." The diagram below identifies the smaller RF spectrum within the electromagnetic spectrum.

Who owns the spectrum?

The electromagnetic spectrum is a resource of each country around the globe. The governments of each country establish a system to manage, protect and regulate the use of the spectrum within their borders.

Is anyone in charge of the spectrum?

Yes and no. The International Telecommunication Union – Radiocommunication Sector (ITU-R) is an organization within the United Nations System that establishes radio regulations. These are the foundation of radio frequency regulations in most countries including the United States.

There are more than 190 member countries in the ITU; however, since the spectrum is a resource of each nation, governments are free to regulate their spectrum resources in their best interest. While the United States adopts most of the ITU-R radio regulations, some are modified to satisfy unique requirements within our country.

Does the Federal Communications Commission regulate the Department of the Navy's use of spectrum?

No. Within the United States there are two bodies that coordinate the regulation and planning of the radio frequency spectrum — the Federal Communications Commission (FCC) and the National Telecommunications and Information Administration (NTIA), an agency of the U.S. Department of Commerce. The FCC regulates nonfederal government use of the radio spectrum; this includes commercial users, private citizens, and state and local governments. The NTIA regulates federal government use of the radio spectrum, including the military departments.

What is spectrum management?

An overarching definition of spectrum management is: "The technical function where use of radio frequency spectrum is controlled to ensure the electromagnetic compatibility of communications-electronics systems." Within the DON, spectrum management is performed at a number of levels including the strategic, operational and tactical levels of the Navy and Marine Corps.

Figure 1. The preponderance of commercial, government and military applications worldwide are performed in these frequencies.
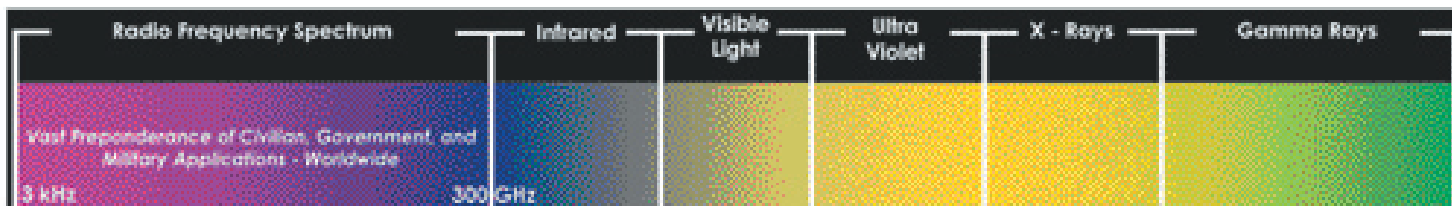
Which frequency band is most important to the DON?

There is no one specific frequency band that is the most important band to the Department. However, the preponderance of the frequencies used by the DON is between 30 Hz to 3 GHz. The Extremely Low Frequency (ELF) band and Very Low Frequency (VLF) band support our tactical submarine forces and other DON capabilities, while higher frequencies in the Very High Frequency (VHF), Ultra High Frequency (UHF) and Super High Frequency (SHF) bands support communications and a myriad of other DON capabilities such as unmanned aerial vehicles. Frequencies in the EHF band support critical DON satellite communications that provide immediate, worldwide communications and intelligence capabilities.

Does the DON use frequencies or have an interest in frequencies higher than the EHF band?

Yes. The DON uses infrared frequencies to support a number of Marine Corps and Navy imaging capabilities. Additionally, the DON uses visible light frequencies to support laser range finder capabilities as well as laser targeting systems. Similar to the radio frequency bands, the DON'S requirements for the use of visible spectrum are growing.

Why is the electromagnetic spectrum important to the DON?

The DON has a unique challenge among the military services since forward deployed Marine Corps forces and the fleet do not have direct access to commercial or military communications systems via landline. The only access to vital communications for forward deployed and at sea forces is via wireless links.

To ensure the Marine Corps and Navy have capable, reliable wireless communications, a broad range of the spectrum is required to support the diverse functions and global responsibilities of the naval services.

What should be in my spectrum reference library?

√ SECNAVINST 2400.1, Electromagnetic Spectrum Policy and Management – http://dodssp.daps.mil/Directives/2400_1.pdf

√ MCO 2400.2, Marine Corps Management of the Radio Frequency Spectrum - go to the Marine Corps home page at http://www.usmc.mil, click on the Publications link at the top, go to the link on the left for Orders and Directives and type "spectrum" in the search bar.

√ OPNAVINST 2400.20E, Navy Management of the Radio Frequency Spectrum – http://dodssp.daps.mil/Directives/2400e20.pdf.

√ NTIA Manual, National Telecommunications and Information Administration Manual of Regulations and Procedures for Federal Radio Frequency Management – http://www.ntia.doc.gov/osmhome/redbook/redbook.html.

√ The FCC rules, Title 47 of the Code of Federal Regulations – http://wireless.fcc.gov/rules.html.

We have enjoyed answering these fundamental questions about the electromagnetic spectrum. There is no such thing as a "dumb" question, so if you have any spectrum questions, please e-mail them to DONSpectrumTeam@navy.mil.   **CHIPS**

ONR's Early Beginnings

Between 1946 and the founding of the National Science Foundation in 1950, the Office of Naval Research was the federal government's only agency whose principal mission was the support of basic research.

In the aftermath of World War II, Americans credited big science, pure science, with having done much to win the war. Even given the traditional American fascination with invention, progress and technology, the Second World War forced technical and scientific advance into popular thinking about defense to an unprecedented extent. People remembered Pearl Harbor and never wanted to be surprised like that again, and saw technology as a guarantor of security. Basic science shared the aura of victory.

The original permanent basic research establishment, ONR, evolved over the last 60 years into something more diversified and in some respects more accountable to its customers than its founders envisioned.

The greatest change occurred in fiscal year 1992, when the Office of Naval Technology (ONT) and the Office of Advanced Technology (OAT), separate agencies that reported to the Chief of Naval Research, were folded into ONR.

With the absorption of ONT and OAT, ONR was "reinvented" and became responsible for applied research and technology development. Since then ONR has worked to integrate the research it supports and to produce an investment portfolio that does justice to its several constituencies: Congress, the fleet, the force, industry and universities.

– Fact sheet from ONR's history page: http://www.onr.navy.mil/about/history/docs/st_invest_pov.pdf.

IA/CND Workforce Transformation

By Mary Purdy
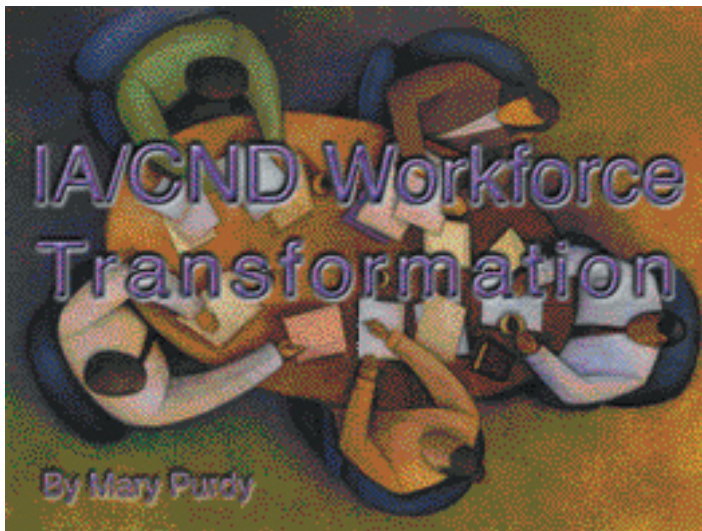
"In achieving our vision of network-centric operations and FORCEnet, it is crucial that the Department of the Navy develops and maintains a sufficiently educated and trained workforce to ensure the security of our networks, information and information systems."

– Dave Wennergren, DON CIO

Strong information assurance (IA) practices provide confidence in information because the five crucial conditions — confidentiality, integrity, availability, authentication and non-repudiation — have been met. Military members, civilian employees and contractors and, in some cases, foreign nationals, perform IA and Computer Network Defense (CND) duties for the 900,000 system users at Navy and Marine Corps commands worldwide.

Information system users may be networked through the Navy Marine Corps Intranet (NMCI), OCONUS Navy Enterprise Network (ONE-NET), Marine Corps Enterprise Network, Integrated Shipboard Network System (ISNS), a legacy enclave, or a combination of networks, and it is up to the diverse IA/CND workforce to secure the networks whether they perform IA tasks for fleet/operating forces or shore/supporting establishments.

When the Defense Information Assurance Program staff stated that all Department of Defense IA/CND personnel, with privileged access or IA management tasks, would be required to obtain IA commercial certifications to meet a DoD standard, there were some who thought it could not be done.

But, in 2004, the Department of the Navy Chief Information Officer (DON CIO), Dave Wennergren, launched a far-reaching initiative, impacting virtually every command across the Department that transforms how the DON trains, certifies and manages the IA workforce. Now, two years later, the prospect of all DON IA personnel being trained to an enterprise standard is being realized as part of the IA workforce transformation.

The DON IA Workforce Working Group (IAWWG), co-chaired by the service enterprise Designated Approval Authorities, Ray Letteer, Headquarters Marine Corps (HQMC) and Donna Martin, Naval Network Warfare Command (NNWC), was chartered to build a Department-wide set of enterprise solutions to transform the DON IA workforce. Armed with the authority to define DON-wide policies, guidance and tools, the IAWWG is significantly improving the Department's security posture through a better trained, educated and managed workforce.

The IAWWG is putting in place plans and procedures to: (1) Identify and tag IA/CND billets and military, civilian and contractor IA personnel; (2) Train and certify personnel according to guidance in the DoD Information Assurance Workforce Improvement Program Manual, DoD 8570.01-M; (3) Track IA personnel electronically; and (4) Report compliance to Congress under the Federal Information Security Management Act (FISMA).

The IAWWG is already improving workforce capabilities by ensuring that all personnel with access to defense information systems have completed "DoD Information Assurance Awareness" training. Additionally, the Center for Information Dominance and the Communications and Electronics School are updating all IA professional classroom training curricula to meet these emerging IA requirements for the DON portion of the Global Information Grid.

An IA training path consisting of blended solutions that include computer-based training and e-learning; on-the-job training; and both service and commercial classroom training; will give a just-in-time economy to military training.

Readily available training will supply a highly mobile workforce with the right capabilities to fill burgeoning IA demands in the field and in the fleet. As classroom training is being updated, personnel in core IA positions and those who are members of the collateral IA workforce (such as combat systems, aviation, logisticians or intelligence analysts) are starting to take commercial certification tests as mandated by DoD 8570.01-M, whether working as a full- or part-time member of the IA workforce.

IA/CND workforce members may strive for one of several approved commercial certifications. Per DoD 8570.01-M, only one IA certification is required for each training level. The training levels and associated IA certifications are shown in Figure 1. The IAWWG Training Tiger Team is currently piloting several courses to determine the best commercial certification training and testing to blend with the military classroom environment.

IA/CND personnel with privileged access must also take the operating system commercial certification that supports the system they operate.

Since commercial certifications have not been a routine part of the IA/CND workforce training solution, new processes and procedures are being developed to support the mandated commercial credentialing. IA workforce members rely on the Navy Credentialing Program Office's new Credential Opportunities On-Line (COOL) Web tool to provide additional IA credentialing information.
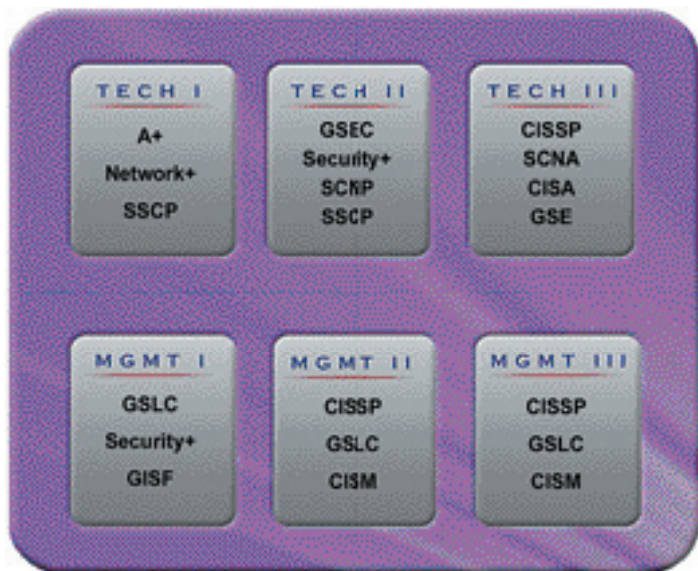
Figure 1.

A process has been developed to buy vouchers for commercial certification tests at the enterprise level. While the first IA commercial certification testing will utilize a manual process, an automated paperless process will be in place by the end of the next fiscal year.

The IAWWG is teaming with the Navy's Credentialing Program Office and the Defense Activity for Non-Traditional Training and Education (DANTES) to build an electronic paperless test voucher system so that the certifications are electronically tracked in military training jackets initially and in civilian electronic training jackets as they become available.

Bringing certification testing to DANTES facilities gets the DON information assurance workforce credentialed more quickly and at less cost. As DON IA professionals become credentialed, their skills will be highly desirable to joint operational leaders because they will be interchangeable in performing the IA warfighting mission.

As the IA credentialing program gets kicked off, previously credentialed Sailors on shore duty at the NMCI military detachments in Norfolk and San Diego are piloting an Enterprise IA Training Management System (TMS) for the Navy IA workforce. TMS is also in use by the aviation community. The TMS will maintain the Sailor's blended training information to include commercial certifications and job qualification requirements.

The Marine Corps' IA training will be tracked in the Training and Education Command (TECOM) Integrated Management System (TIMS).

If this tool meets training and workforce management requirements, it will be recommended as a part of the Sea Warrior Enterprise tool set. U.S. Pacific Fleet and U.S. Fleet Forces Command are implementing the "Fleet IA Workforce Improvement Initiative" to: (1) Systematically deploy mandated training and commercial certification testing to assess the impact and apply lessons learned for fleet implementation, and (2) Develop

and apply new metrics for IA, CND and network operational performance.

Once training, testing, assessment and credentialing processes are in place, the IA workforce will engage in full-scale implementation.

The Navy and Marine Corps Designated Approval Authorities are developing a joint Navy Training Management and Planning System IA dashboard that will ultimately link individual manpower, personnel and training systems to a single source for determining Department-wide IA readiness. This system will monitor, track and report on the total IA workforce with training and credentialing metrics visible to information assurance managers at a moment's notice.

A highly trained and educated IA and CND workforce gives warfighters, commanders and users the confidence and trust they demand for the operation, security and integrity of DON technology.

Reference Tools

DoD Directive 8570.1 of 15 Aug 2004, "Information Assurance (IA) Training, Certification and Workforce Management" – http://www.dtic.mil/whs/directives/corres/html/85701.htm

DoD 8570.01-M of 19 Dec 2005, "IA Workforce Improvement Program" – http://www.dtic.mil/whs/directives/corres/pdf/p857001m_121905/p857001m.pdf

DON Strategy for Achieving Consistent Information Assurance (IA) Training, Certification, and Workforce Management - http://www.doncio.navy.mil/iaworkforce

To find out more about the DON IA Workforce Transformation Program and credentialing the IA Workforce, contact the Navy (757) 417-6757 or Marine Corps (703) 693-3490 points of contact.

For Navy "COOL" information e-mail questions to

crry_cqcredentials@navy.mil or phone

(850) 452-6683, DSN: 922-6683.

Mary Purdy is the DON IA Workforce Working Group facilitator. CHIPS

Full Speed Ahead
SPAWAR Systems Center Norfolk Sets Course for Continued Success

By Sharon Anderson

It was a clear day for sailing, Sept. 22, 2006, when the Space and Naval Warfare (SPAWAR) Systems Center Norfolk (SSCN) set course under new leadership. Commanding Officer Capt. David A. Pry was relieved by Capt. Joseph S. Konicki, who pledged to continue to focus on the fleet, and to continue the innovative leadership methods that Pry had launched during his command.

"My longer term goal is to seek out the best practices both within the U.S. government and from industry, and map those to our internal processes. Throughout turnover, SSCN leadership communicated to me that SSCN does not seek to be 'good enough,' we seek to be great, and we seek to achieve excellence in all areas," Konicki said.

Meanwhile, enthusiasm was high as military, civilian and contractor support personnel took time to reflect on the SSCN accomplishments of the past two years. Under Pry, military retention was 100 percent, and about 20 SSCN military personnel have or will serve as Individual Augmentees in Iraq in support of the global war on terror.

SSCN Executive Director Patricia A. Fuller said that Capt. Pry would be sorely missed by SSCN personnel and its customers.

"Capt. Pry is a people person. His commitment to SSCN motivated our personnel to even greater successes."

In June 2005, SSCN became certified, through the Software Technology Support Center, as a Capability Maturity Model (CMM) Level 3 organization and instituted other metrics for measuring customer satisfaction with the products it delivers to the fleet. CMM Level 3 certification means that SSCN products are developed quicker, at a lower cost and with greater reliability.

Guest speaker and SPAWAR Commander Rear Adm. Michael C. Bachmann said that Pry concentrated on what he considers the four essentials of leadership: people, processes, products and metrics.

"I have been affiliated with them for a long time. They used to be totally focused on software development and testing. They have transformed themselves over the past decade. They have started to develop themselves through the CMMI process to ensure they have good oversight on software development and quality.

"I am impressed by their effort to have folks get their PMP (Project Management Professional) certification. This will be our forte in the future. That is a critical skill set that is needed to make sure software is delivered on time and that it meets its key performance parameters. They have done a good job in both of those venues, not only Norfolk but Systems Centers New Orleans, Charleston and San Diego," Bachmann said.

SPAWAR Commander Rear Adm. Michael C. Bachmann congratulates former SSCN commanding officer Capt. David A. Pry for a job well done during the SSCN change of command ceremony Sept. 22, 2006, on board Naval Station Norfolk. Photos by SSCN Deputy Director Fleet Support Mike Siedlecki.

Capt. Joseph S. Konicki, SSCN's new commanding officer (left) and retired Capt. Fred Mingo former commanding officer of SSC New Orleans at the SSCN change of command ceremony.

Rear Adm. Bachmann congratulated Pry for improving fleet satisfaction and on SSCN's role as a trusted agent in serving its customers. To stay close to the fleet, SSCN has branch offices in San Diego, Calif., and one in Yokosuka, Japan, under the leadership of Cmdr. Steve Bowman.

SSCN provides global "cradle-to-grave" software support and engineering for fleet standard automated information systems, afloat and ashore. SSCN builds, integrates, delivers and supports the information technology needed by Navy and Marine combat forces and the supporting shore infrastructure.

SSCN systems are on Navy ships, submarines and aircraft, and in supply centers and medical facilities. SSCN's software products include systems for weapons maintenance and configuration management, supply, food services, retail, manpower administration, medical and travel. More than 500,000 Sailors and Marines use SSCN systems to ensure logistics readiness.

Just a few of SSCN's products include:

• NALCOMIS, Naval Aviation Logistics Command Management Information System, an automated information system that provides aviation maintenance and material management;

• SNAP - Automated Medical Systems (SAMS), which reduces the administrative workload, enhances the credibility, standardization and quality of health care documentation in the medical environment;

• WEBATIS, a government-off-the-shelf application used by the Navy and Marines as a digital retrieval, display and printing system for technical documentation; and

• NTCSS, Naval Tactical Command Support System, a multi-application information system program that provides standard information resource management to afloat and shore-based fleet activities.

Pry thanked SSCN personnel, SSCN Executive Officer Capt. Jim Cox, SPAWAR headquarters leadership and the other systems centers for their support.

"We all held a bond that was based on collaboration and trust vice competitiveness. This being the cornerstone of our working arrangement will ensure much success in our future."

In conclusion, Pry talked about the synergy created between SSCN, Team SPAWAR and SSCN customers, such as Fleet Forces Command, Naval Supply Systems Command and the medical community.

These partnerships, Pry said, led to improved products and services. He discussed several new SSCN–developed systems to be delivered soon, including the Logistics Maintenance Automated Information System (LMAIS) to be installed on the Littoral Combat Ship next June.

"In the dynamic, complex environment that SSCN operates in, not only must you be sound internally from an organizational standpoint but managing external activities and factors are equally as important. Nurturing these relationships through mutual respect, understanding and teaming to achieve a common goal has led to our collective successes, and more importantly, friendship," Pry said.

For more information about SSCN go to http://www.scn.spawar. navy.mil.

Sharon Anderson is the CHIPS senior editor, contact her at chips@navy.mil.   **CHIPS**

SSCN has branch offices in San Diego, Calif., and one in Yokosuka, Japan, under the leadership of Cmdr. Steve Bowman (left) and SKCM Fernandez.

SSC San Diego Executive Director Ms. Carmela Keeney, SSC Charleston ISR and Navigation Division head Bobby Hensley (left) and SPAWAR Deputy Commander Rod Smith at the SSCN change of command ceremony.

SSCN information technology intern Lt. Jeretta Dillon (right) and USMC CW04 Lori Dean, SSCN Marine Fleet Support.

Urban Resolve 2015

By Sharon Anderson

A rich experimentation environment replicated a Joint Task Force (JTF) headquarters in a multifaceted experiment led by U.S. Joint Forces Command. Set in 2015, Urban Resolve's purpose is to guide the development of critical warfighting capabilities for the future joint force commander, with a particular focus on those needed for effective urban operations and the security of an urban population.

Since World War II, U.S. forces have sought to avoid operations in major urban areas to minimize the costly damage in both lives and property expected inside cities. But according to USJFCOM, the explosive growth of the world's major urban centers, changes in enemy strategies, and the global war on terrorism have made the urban battlespace potentially decisive and practically unavoidable.

To prepare for both the current and future challenges, 13 participating nations engaged in the experiment with modeling and simulation (M&S) and scenarios developed and executed by USJFCOM's Joint Innovation and Experimentation (JI&E) Directorate (J9).

Applications for Modeling and Simulation

Urban Resolve assists in aggressively advancing the development of the M&S systems needed for urban warfighter training. But the benefits from M&S are not limited to warfighting. According to Urban Resolve 2015 experiment director Army Col. Michael Postma, USJFCOM works with multinational and interagency partners worldwide to examine solutions ranging from rapid recovery in the aftermath of a tsunami, to how to successfully stabilize and reconstruct a war-torn nation.

According to J9 Director Rear Adm. James A. Winnefeld, there is great potential for these powerful M&S tools, particularly when networked.

"We have this wonderful Defense Research and Engineering Network (DREN) which is an extremely high bandwidth network for computer simulations across the country. If you are Virginia Gov. Tim Kaine and you have a new emergency operations center that you want to test and train to, theoretically, you can hook into this DREN network and we can run a simulation here for you to test your processes and train your people to handle emergencies."

The M&S tools can allow users to look at alternate courses of action in a natural disaster, Winnefeld said, and they have application in homeland defense.

"If you are eight feet under water and have lost the Hampton Roads Tunnel, what kind of evacuation routes do you need? What kind of relief efforts? What is the economic impact and so on?"

JFCOM will be engaging in an Urban Resolve homeland defense exercise, which is expected to be led by the Department of Homeland Security and U.S. Northern Command. According to Winnefeld, USJFCOM will partner with them to help run the experiments.

The Synthetic Environment for Analysis and Simulation (SEAS) is an integral part of the M&S tools. It provides insights as to how

Sept. 20, 2006 – J9 Director Rear Adm. James A. Winnefeld in USJFCOM's Joint Futures Lab explaining the significance of Urban Resolve 2015 for conducting effective urban operations.

populations might respond to actions taken against the political, military, economic, social, infrastructure and information (PMESII) foundations of their countries.

"SEAS gave us valuable input into how well a plan was executed based upon population behaviors," Postma said. "It helped us to determine the effectiveness of courses of action especially in the areas of long range diplomatic, information, military and economic conditions which are oftentimes difficult to measure."

Other tools, capabilities and potential solutions to assist warfighters during the experiment included the Army's Joint-Command Post of the Future; the Joint Force Information Component Command; Integrated Chemical Biological Radiological and Nuclear Defense; the Tele-Engineering Kit; and the Tele-Engineering Ops Center.

Urban Resolve Participants

Urban Resolve 2015 included the joint, coalition and U.S. government and nongovernment organizations that a JTF staff would routinely collaborate with in conducting military operations or providing humanitarian assistance.

Over the course of the three-phase experiment about 1,200 participants were distributed across 18 sites across the country, including USJFCOM, Special Operations Command, the Joint Staff, the Institute for Defense Analysis, Defense Threat Reduction Agency, Defense Advanced Research Projects Agency, the services, and other U.S. and multinational agencies.

Foreign liaison officers, German Air Force Lt. Col. Ralf Gosch and Republic of Korea Air Force Col. Byungjin Park discussed the importance of approaching problems from multicultural perspectives and operational experiences. U.S. Air Force Col. Bill Coburn agreed that working in a coalition environment has produced important — and sometimes surprising results.

"What's amazing is that in discussing problems someone will bring up something that no one else had thought of because of their unique views. It's not that someone is right or that someone is wrong; it's that working together provides so much value to what we are doing," Coburn said.

Setting the Stage

The scenario involved a U.S.-led coalition force that must confront and overcome a skilled adversary who is equipped with modern capabilities and is operating in an urban environment.

The urban environment is crowded and complicated with many variables that must be analyzed to develop doctrine and strategies. USJFCOM personnel developed the concept of how they think joint urban operations will be conducted in the future.

According to Winnefeld, the concept deals with the entire spectrum of conflict — all the way from guerrilla warfare, to counterinsurgency — to major combat operations. The concept examines isolating and controlling an insurgency.

Retired U.S. Army Maj. Gen. Larry Budge is refining the concept. According to Budge, the chief factors for success in this kind of scenario are ensuring the security of the population and winning the intelligence war.

"In a counterinsurgency one of the fundamental facts is that the population is the center of gravity. The vast majority of the people are probably on the fence. They do not support the bad guys, but they probably do not support the good guys either. You have to focus on this population, get them off the fence and on your side.

"Another factor is that you have to provide security for this population. No matter how much they are in favor of you, they are not going to help you if it means they are going to be killed the next day. Security is one of the major factors in addition to controlling the population," Budge said.

Added to this complexity is that insurgents are embedded in the general population, which makes them difficult to find. Superior intelligence is needed to find them — without endangering the general population.

"The third big principle of isolate and control for counterinsurgency is to win the intelligence fight — to get more information on the enemy than he can get on us — and use it to root him out of the population. You have to be careful. If you kill or injure the population while you are routing out this adversary, you are going to cause more people to be recruited by the insurgency," Budge said.

There are many aspects to information superiority in this volatile environment. Keeping people informed is essential to securing their trust. In this regard, Integrated CBRN, Chemical, Biological, Radiological, Nuclear, tested countering a potential weapons-of-mass-destruction threat in a future environment.

"The information superiority piece is much more than trying to get the story out. If there is a chemical released, you can put out information that will reassure the population and let them understand what is going on. By telling them where the most dangerous places are; the symptoms and what they should do; why they see people walking around with funny suits on; and why they should not panic — could maintain stability. If you do not do this, you will end up with a panicked population," Winnefeld said.
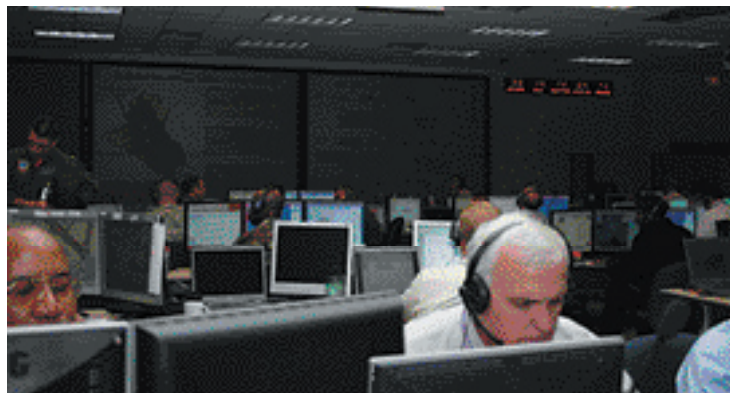
The "white cell" or experiment controllers for Urban Resolve 2015.

Why Experiment?

Experimentation is the military's primary method for exploring, testing and validating warfighting ideas and concepts. Using M&S technology is significantly less expensive than the costs associated with live experimentation where equipment, infrastructure and personnel must be deployed and recovered after the experiment concludes. The virtual battlespace also eliminates wear-and-tear on people and equipment that would be needed to establish an operational theater.

Although some advanced technologies were used, such as laser technology by the U.S. Air Force and unmanned vehicles by the Navy and Army; the experiment wasn't really about technologies — or winning or losing, according to USJFCOM. What is important is testing concepts and doctrine.

"In a counterinsurgency operation in an urban environment decisions were made about what kind of forces are going to be used? What would be the role of air power versus the role of ground forces? How do we conduct ISR – intelligence, surveillance and reconnaissance?" Winnefeld said.

Combatant commanders and the services are anxious to fill capability gaps so Winnefeld discussed the expected outcomes of Urban Resolve.

"Two things come out of experiments like this — concepts, it either worked or it did not work, and material solutions that worked or did not work. We shoot the losers and get them out. Then we try to transition the winners on both of those things."

If it is a concept that worked, it can be immediately put into doctrine and into the training environment, according to Winnefeld.

"With material solutions it is a lot more challenging because there is money involved and you have to persuade someone to buy this — and they are already busy buying other things. There is a natural progression from the need that the person on the ground has — the gaps they are trying to fill — and our ability to experiment and find solutions.

"Finding solutions is not the easiest thing in the world. Then we must have the courage to throw the bad ones out and keep the good ones and transition them into the active forces." **CHIPS**

NPS Teams with Royal Thai Armed Forces to Test Wireless Networks

By Barbara Honegger

A Naval Postgraduate School faculty, student and contractor team joined forces with 11 Navy Reservists from the Office of Naval Research Science and Technology program in May and June to field test a rapidly deployable surveillance and tracking network in a drug interdiction exercise in Thailand, the longest standing U.S. treaty partner in Asia.

Data from air, ground and underwater sensors, unmanned aerial vehicles (UAVs), balloons and speedboats were fed into a Tactical Operations Center (TOC) and Royal Thai Armed Forces command, control, computers and intelligence centers.

"A critical backbone of the global war on terror and network centric warfare is the ability to rapidly field low cost mobile wireless communications networks in hostile environments with our coalition partners," said NPS information sciences research associate James Ehlert, Coalition Operating Area Surveillance and Targeting System (COASTS) project director.

"COASTS catalyzes this technology sharing while actively addressing the security needs of our key allies," he added. "It's a win-win, because sharing technology and expertise that makes our partners more secure also makes us more secure.

"The Thais learn how to better secure their borders, interior and littorals, and Naval Postgraduate School students gain valuable thesis research opportunities. For our DoD contractor partners, we operationally test cutting-edge commercial technologies in challenging terrains and climates and feed the results back to participating companies."

In addition to unattended air, ground and underwater sensors, the commercial-off-the-shelf broadband wireless network included four mini helicopters and two flying-wing UAVs with video cameras; Thai Navy speedboats conducting maritime surveillance and interdiction; wearable computers with shared situational awareness displays; a networked tethered balloon surveillance node with high resolution video; a mountain-top communications node with video camera and webcam; a full-color night vision camera; long-haul, point-to-point 802.16 and satellite reach-back links to the Royal Thai Air Force headquarters in Bangkok; and a TOC staffed with U.S. and Thai personnel.

The heart of the system was a cutting edge environmental and security monitoring system that processes inputs from all local and remote sensors and instantly displays them on laptops as well as wearable and handheld computer screens in an easily readable 3-D format.

"The COASTS surveillance and tracking network was able to transform visibility of only a few meters in hostile, humid jungle terrain into total shared situational awareness," said Lt. John Richerson, COASTS-06 student team leader who coordinated and ran the riverine drug interdiction exercise from the TOC. "From 2005 to 2006, the sensor-to-shooter grid has evolved into a mature test bed for C4ISR COTS technologies while providing our students and DoD contractors with unmatched learning and product development opportunities."

"The hardware is the easy part," Ehlert added. "The hard part is getting all the hardware, software and people to seamlessly work together."

COASTS exercises have proven highly valuable for the Royal Thai Armed Forces. The director general of the country's Defense Research and Development Office, Lt. Gen. Apichart Timsuwan, and Royal Thai Air Force Group Capt. Teerachat Krajomkeaw, who heads the Combat Research and Development Organization within the Directorate of Operations at the Royal Thai Air Force Headquarters, sponsored the 2006 program.

"The COASTS-06 field experiment program has been a great opportunity for science and technology information exchange and for exercising combined interoperability between the Royal Thai Air Force and the U.S. military," said Krajomkeaw at the Royal Thai Air Force headquarters after action meeting. "We hope to build on the success of COASTS-06 next year in COASTS-07."

"Next year's exercise — a terrorist interdiction scenario culminating in the Port of Honolulu — will add the Malaysian Maritime Enforcement Agency, the Office of Defense Cooperation Indonesia, Australia, and U.S. Navy (Commander, Seventh Fleet) and Coast Guard assets in Hawaii as additional operational partners.

"The exercise will also provide major warfighting value to the Navy Expeditionary Combat Command recently charged with implementing the CNO's vision for small boat patrol craft just taken over from the Marine Corps," Richerson said. "It will be an order of magnitude larger with multinational partners, a multimillion-dollar budget and major congressional attention."

"The technologies and capabilities demonstrated in COASTS-06 would be extremely useful for our operations in

Royal Thai Air Force Group Capt. Teerachat Krajomkeaw (left); Lt. John Richerson, NPS COASTS-06 student team leader (middle background); senior military officers from the Royal Thai Air Force and Interagency Intelligence Fusion Center; and NPS faculty network expert J.P. Pierson (right foreground) observe COASTS-06 operations from the TOC near Chiang Mai, Thailand.

Southern Thailand," said Royal Thai Air Force Air Marshall Suthichoti. "And they're applicable not just to the Air Force, but to the (Thai) Army and Navy as well."

"This was a wonderful opportunity to engage in military-to-military contact with the upper echelon of the Royal Thai Air Force that I'll be able to leverage throughout my career," Richerson added.

COASTS-06 was also of high value to the project's 12 commercial participants, including leading design engineers and three corporate chief executive officers.

"A big plus for COASTS commercial team members is that we can special engineer our equipment for worst case scenarios and test it in weather and terrain scenarios we wouldn't otherwise have access to, providing invaluable data for future product development," said Mercury Data Systems' COASTS liaison, senior network engineer and Navy Reserve Information Systems Technician 3rd Class Ryan Hale.

"The same communications system that has a 10-mile footprint in Monterey, Calif., (site of the Naval Postgraduate School), for instance, has only a one-half-mile footprint in Thailand, due in part to the high temperature and humidity of the area. You have to test in the actual environment to know how to configure the system.

"COASTS is one of the most unique programs connecting the military and commercial worlds," said Hale, also a former information sciences research assistant at NPS. "It lets us work hand-in-hand with the military in the design and development of an all-COTS system with real-world applications. Being a full partner has also opened DoD doors for us, for example, with the Office of Naval Research. As a result of our participation, we now also have opportunities with the Naval Research Laboratories, the Special Operations Command and others."

Some commercial technology used in the project was originally developed for COASTS. An example is Mercury Data Systems' TrakPoint, a mobile shared situational awareness tracking program that uses software and inertial gyros to locate and visually display on a laptop or workstation screen where the user has walked.

Above, Lt. Cmdr. Steve Padget and Lt. Joe Berrios of the Office of Naval Research Reserve Detachment prepare a RotoMotion VR-20 UAV for flight operations during COASTS-06 field tests in Thailand. Right, NPS operations research student Ensign "Red" Miller on the ground in Thailand during COASTS-06 with a Kestrel shoulder-mount camera, ruggedized 802.11g portable computer, and Deny-GPS, a precision inertial navigation system that allows his position to be calculated in a non-GPS environment. Data on Miller's position were relayed via an 802.11 wireless mesh network into the common operating picture viewed by officers in the Tactical Operations Center and other connected command centers.

By clicking map icons, a viewer can instantly see what is being recorded by cameras and other recording devices at multiple distant locations in near-real time, and access to the displays can be hierarchically controlled.

COASTS-06 U.S. sponsors included the Office of the Secretary of Defense; U.S. Pacific Command, with Mr. Chris Voght, USPACOM staff science adviser as chief liaison; U.S. Coast Guard Monterey; U.S. Embassy Bangkok; Joint Interagency Task Force-West; U.S. Marine Corps Systems Command; the Air Force Research Laboratory; and the U.S. Military Advisory Group Thailand.

International sponsors, participants and observers included the Royal Thai National Security Council; Royal Thai Defense Research and Development Office; Interagency Intelligence Fusion Center at Chiang Mai; Royal Thai Air Force Academy; Malaysian Maritime Enforcement Agency; Australian Defense Technology and Management Advisor, Thailand; and the National University of Singapore.

The program supports key USPACOM goals of regional maritime security, theater security cooperation, advancing the global war on terrorism and supporting homeland defense.

In addition to Ehlert, COASTS-06 NPS faculty members were Ed "Tuna" Fisher and networking expert John "J.P." Pierson, also a member of the NPS Innovation and Technology Center.

NPS students participating in the NPS-Thai exercise were Lt. John "Swampy" Richerson, student team leader; Lt. Robert "Ho" Hochstedler; Lt. John Powers; Ensign Ryan "Red" Miller; Ensign Joseph Russo; and Ensign Michael Chesnut.

The ONR Reservists were Capt. Paul Marshall, officer in charge; Cmdr. Paul Kling, UAV expert and assistant officer in charge; Capt. (Sel.) Pete Gamerdinger; Cmdr. Scott Guinn, assistant air boss; Cmdr. Dean Schmidt; Cmdr. Nathan Beltz; Lt. Cmdr. Steve Padget; Lt. Cmdr. Kevin Blenkhorn; Lt. Joe Berrios; Lt. Pitch Bencharit and Aviation Electronics Technician 1st Class Candido Gomez.

In addition to being a NPS inaugural COASTS partner, at any one time Thailand supports up to half a dozen officer students at the Naval Postgraduate School pursuing thesis research in support of their country's security needs.

Ms. Honegger is a senior military affairs journalist with the Naval Postgraduate School.

For more information about NPS programs, go to www.nps.edu. CHIPS

DON Enterprise Architecture 2006

By the DON CIO Enterprise Architecture, Standards and Infrastructure Team

What is EA-2006?

The Department of the Navy's Enterprise Architecture 2006 (EA-2006) is a management framework that will be used as a catalyst for EA decision support throughout the Department and for addressing long-standing DON capability gaps. It provides Department leaders, program managers, Functional Area Managers (FAMs), and command information officers with insight and understanding of the scale, scope, objectives and progress of DON architecture efforts. The EA-2006 highlights progress and identifies areas requiring attention.

EA-2006 is not a conventional architecture product containing operational views and system views; instead, it is considered a management view of architecture across the DON. EA-2006 is a compendium — a concise but comprehensive summary — of DON architecture projects. It depicts architecture overlaps and gaps.

EA-2006 Objectives

The primary objective of EA-2006 is to create a central document that captures domain-level architecture efforts across the DON. EA-2006 will support the objectives listed below.

Figure 1. Enterprise Architecture-2006 home page

Enterprise Architecture 2006 Objectives

• *Serve as the DON management view of the DON Enterprise Architecture*

• *Link architecture development with Department of Defense (DoD) and DON strategic goals and objectives*

• *Catalog architecture development and production efforts*

• *Provide concise descriptions of various architectures as well as planned developments and product location*

• *Provide a single source in which anyone can locate architecture development efforts and associated products*

• *Be a catalyst for architecture consolidation and collaboration*

• *Be a catalyst for improving architecture governance*

• *Respond to Congress, General Accountability Office (GAO), Office of Management and Budget (OMB) and Office of the Secretary of Defense (OSD) inquiries*

EA-2006 Report

EA-2006 examines strategic documentation and architecture alignment to DON strategic goals. EA-2006 follows the basic organizational construct outlined in Naval Power 21. The EA-2006 Web page, as shown in Figure 1, allows users to drill down to the compendium information for each item.

EA-2006 is not an architecture repository. It is an interactive report that outlines the major architecture work underway across the Department and points authorized users to the repositories that contain actual artifacts.

Supporting Efforts

In addition to specific DoD Architecture Framework (DODAF)-compliant architecture products, EA-2006 recognizes that a host of supporting architectures exists throughout the Department. For example, FAMs have amassed a substantial body of architecture artifacts within the DON Application and Database Management System (DADMS).

In addition, important architecture databases exist across the Department that contain thousands of artifacts and form the basis for essential architecture integration and federation efforts. EA-2006 enables managers to review architecture governance and gain insight into the decision processes involved in architecture validation and approval.

The DON believes that the development of integrated architectures at all levels (program, domain and enterprise) is an essential component of transformation.

As the Department moves toward attaining the goals contained in Naval Power 21, it must deal with increasing technological complexity, reduced decision cycles, and an increased need to fuse and share information. Architectures are a fundamental building block for managing change and aligning scarce resources.

The DON EA-2006 is a key enabling resource to the Department-wide architectural compliance needed to transform the Navy and Marine Corps team into an effective net-centric fighting force.

Accessing the EA-2006

EA-2006 can be found at http://www.doncio.navy.mil under the "Products" tab.

CHIPS

Enabling Mission Assurance Through an Aggressive Critical Infrastructure Protection Program

By Steve Muck

A primary goal of the Department of the Navy's Information Management and Information Technology Strategic Plan is to "protect and defend our Naval critical infrastructures, networks, and information to maximize mission assurance." This article provides an update on how the DON Critical Infrastructure Protection (CIP) program is supporting this goal.

"Mission assurance" is the goal of the Department of the Navy CIP program. Simply put, achieving this goal requires:

(1) Identifying vulnerabilities to assets critical to mission execution;
(2) Remediating such vulnerabilities to protect against possible compromise and, if disrupted by events;
(3) Implementing effective consequence management planning to minimize impact to mission completion; and
(4) Maintaining an active education and outreach effort to proactively institutionalize CIP throughout the Department.

Since its inception more than six years ago, the DON CIP program has developed and implemented policy, processes and products to assist installation commanders/asset owners in improving CIP posture at DON installations worldwide. Current efforts are continuing this strategy as summarized below.

(1) Identifying Critical Asset Vulnerabilities

As the program matured, DON CIP vulnerability assessment protocol expanded beyond Antiterrorism/Force Protection (AT/FP) to include the areas of Computer Network Defense (CND), Commercial Dependency (CD) and Consequence Management (CM) planning — producing a new, improved Naval Integrated Vulnerability Assessment (NIVA). This full spectrum NIVA was conducted at approximately 50 installations over a three-year period, providing a comprehensive snapshot of the current CIP posture to DON commanders and asset owners. As Department of Defense (DoD) and DON policy and guidance evolved, so has the DON CIP team's approach to vulnerability assessments. Current efforts involve the following activities.

Defense Critical Infrastructure Program (DCIP) module assessments to support Chief of Naval Operations IVAs

The assistant secretary of Defense for Homeland Defense (ASD(HD)) disseminated DCIP benchmarks and standards for assessments on critical asset commercial dependencies earlier this year. The resultant "DCIP module" focuses on determining whether significant vulnerability exists in commercial infrastructures that support defense critical assets.

Current DCIP benchmark areas include: energy (electric power, natural gas and petroleum); transportation (roads, rail, aviation, seaports and waterways); water systems (potable, industrial and firefighting); chemical storage and use; heating, ventilation and air conditioning; and communication networks.

The CNO IVA DCIP module focuses on defense owned, leased and managed assets, but its execution also examines commercial providers outside the fence lines of installations.

Opportunities to execute this new approach recently occurred when DON CIP team members conducted DCIP module assessments during the CNO IVAs led by the Naval Criminal Investigative Service at Naval Air Station Oceana in Virginia Beach in July, Naval Air Station Whidbey Island in August and NAS Sigonella, Italy, in September.

Navy Reservists and active duty personnel don MCU-2P Chemical, Biological and Radiological (CBR) warfare gas masks during training. U.S. Navy photo.

Results of these three pilots will be incorporated into next year's CNO IVAs. Feedback from use of the DCIP questions in these assessments is being incorporated into the DON CIP Self-Assessment Tool 2.0.

DON CIP Self-Assessment Tool (SAT)

The ultimate objective of the self-assessment tool is to enable any installation commander/asset owner to perform a critical infrastructure vulnerability assessment at any time. In previous versions, collaboration with DON, DoD, federal and educational entities enabled incorporating best-practice processes and reference materials into a CD-ROM-based CIP self-assessment tool.

This approach has been incorporated into the new, enhanced DON CIP SAT 2.0, which will be accessible via SIPRNET (only) to any installation commander/asset owner.

DON CIP SAT 2.0 incorporates the latest DCIP assessment benchmarks as well as proven best practices with its five-module survey in AT/FP, CND, CD, CM planning, and Chemical, Biological, Radiological, Nuclear and High Yield Explosive (CBRNE) incident response.

For example, questions include whether personnel are trained and equipped for a CBRNE incident. Photos on these pages illustrate types of training.

In addition to the "any time, any place" value, benefits of the DON CIP SAT 2.0 include:

(1) Assessments at a fraction of the cost of current "boots on the ground" protocol;
(2) Broad range of reporting formats;
(3) Consistent, standardized process;
(4) Modular structure that is expandable and easy to keep current; and
(5) One database repository of assessment results with extensive audit and report capabilities.

Development is currently on schedule with completion planned by the end of the first quarter of fiscal year 2007.

(2) Remediating Critical Asset Vulnerabilities

The goal of successful remediation is to achieve maximum return on investment while focusing limited resources on the most essential assets. The Remediation Planning Guide, published in 2004, provides a methodology and plan of action that assists DON entities in developing vulnerability remediation strategies that balance resources and risk.

A new DON CIP effort, Command Remediation Visits, seeks to assist installation commanders in remediating vulnerabilities identified during IVAs. Such remediation visits provide on-site analytical assistance, using the DON Remediation Planning Guide as one tool. For example, the DON CIP team scheduled a Command Remediation Training visit to NAS Whidbey Island to address vulnerabilities identified during its August CNO IVA.

As a direct result of such efforts, ASD(HD) requested support and leadership from the DON CIP team to develop a Remediation Planning Guide suitable for use across DoD. To achieve that goal, an ASD(HD) Remediation Planning Working Group consisting of representatives from the services, Joint Staff, ASD(HD), combatant commanders, and DoD agencies have met to collaborate in developing a DoD-wide guide. Availability of this new planning guide is expected during the first quarter of fiscal year 2007.

(3) Implementing Effective CM Planning

Consequence management planning was added to the NIVA protocol in 2002. CM planning assessments review how well an activity's plans and procedures support its overall continuity of operations. Over the three-year period that NIVAs were conducted, the DON CIP CM team reviewed more than 175 CM plans.

A consequence management planning module has been incorporated into the CIP SAT 2.0 based on the best practices utilized in those assessments as well as the guidance provided in the DON CM Planning Guide, published by the CIP Program in 2003, with an update in 2004.

The DON CM Planning Guide provides methodology and guidance to assist CM planners in developing strategies and plans that will maintain continuity of operations during or after a disruptive event, man-made or act of nature. A working group is evaluating whether the guide should be made mandatory.

(4) Maintaining an Active Education and Outreach Effort

Institutionalizing CIP throughout the DON is a primary goal served by education and outreach efforts. Recent activities in this area include:

School-house training: Incorporating CIP training throughout the Navy and Marine Corps is an integral component of Secretary of the Navy Instruction 3501.1A (CIP) and supports DoD Directive 3020.40 (Defense Critical Infrastructure Program). Since August 2005, more than 390 prospective commanding officers (PCO) of surface ships, submarines, aviation squadrons and shore bases have attended DON "CIP Awareness" briefings.

CIP awareness has been incorporated into the "Commanding Officer Antiterrorism Training" course at the Center for Security Forces

Navy Reservists and active duty personnel in an urban warfare training scenario. U.S. Navy photo.

(CSF) in Chesapeake, Va.; PCO training at the Surface Warfare Officer School and the Naval War College (NWC) in Newport, R.I.; the Aviation Command Training School in Pensacola, Fla.; and the NWC College of Distance Education "Joint Maritime Operations" course and NWC-Monterey Programs in Norfolk, Va. CIP Awareness has also been presented for one year in the Antiterrorism Officer Course at CSF, adding 330 command antiterrorism officers to those briefed on DON CIP.

Web-Based DON CIP Program Course: This interactive multimedia suite of instructional courseware defines the DON CIP initiative and the roles and responsibilities of DON personnel in an effective CIP program. The four modules are categorized as Navy Courses DON-CIAO - 5862 - 1, 2, 3, 4 and Marine Corps Courses DI5500A, B, C, D. These courses are available to Department personnel worldwide through the Navy Knowledge Online and the MARINENET portals at http://www.nko.navy.mil and http://www.marinenet.usmc.mil, respectively.

The Way Ahead

The DON CIP program will continue to pursue policy and practice improvements to enhance CIP posture, including: IVA support; self-assessment capability; remediation assistance; consequence management planning guidance; and further institutionalizing CIP throughout the Department.

Contributing to DoD-wide implementation of DON CIP products and tools is another team goal. By continuing to build on achievements made and establishing new objectives to meet tomorrow's warfighting requirements, the DON CIP program will remain focused and effective in enabling mission assurance.

For more information about the ASD(HD) Critical Infrastructure Program go to http://dod-map.msiac.dmso.mil/oasd.htm.

For more information about the DON CIP Program go to http://www.doncio.navy.mil and click on the Project Teams tab, then click on Critical Infrastructure Protection.

Steve Muck is the DON Critical infrastructure Protection team leader. CHIPS

The Internet is a big place. It may not be as large as the universe, 78 billion light years, but it is quite probably the largest structure any of us will encounter.

I sometimes hear people compare trying to find a piece of information on the Internet to searching for a needle in a haystack. I do not find that a good analogy because searching the Internet for a "needle" will retrieve links to: the Space Needle in Seattle, Wash., needles for record players, cross-stitch supplies and medical supplies, among others.

As this example illustrates, we cannot expect to search the Internet using single, simple terms and expect to get anything resembling focused, relevant results.

In a haystack, you can use a metal detector to find your needle providing the needle contains ferrous metals in sufficient quantity and is the only metal object in the hay. The object of an Internet search engine is to transform the search back to the haystack variety, with the search engine sifting through the stack to bring back the one point of information we want. While defining an effective Internet search is more involved than waving a metal detector over a pile of hay and waiting for a beep, with the right combination of search terms it can be fairly simple.

Before we let the searching begin, I have two points of information. First, when I reference search terms, I will put them between square brackets [xx] instead of quotes. Quotation marks have a specific function in searching, which we will look at later in the article. Second, I rarely, if ever, look past the first page of search results. My experience is that relevance drops off very quickly after the first 10 results, and the links referenced on pages two through whatever tend to be redundant.
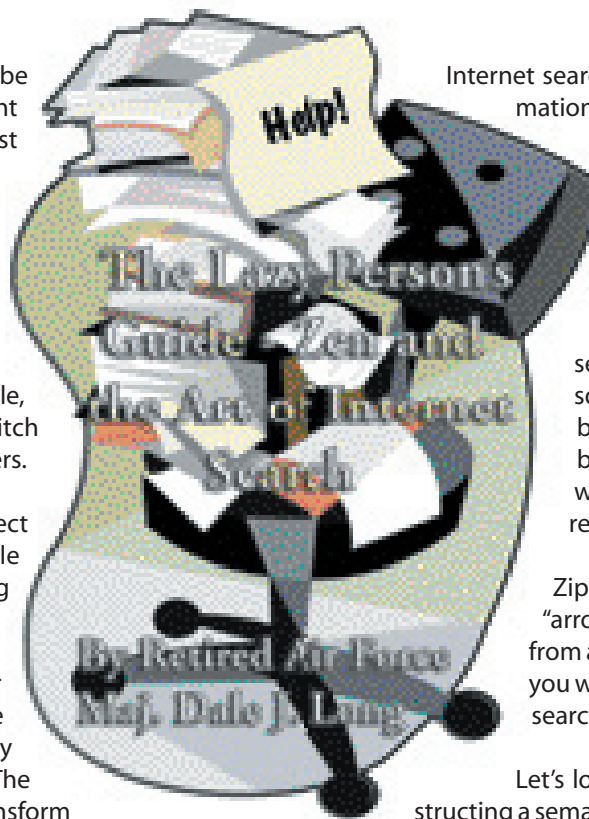
A Hunting We Will Go

For some reason, my family, friends and co-workers like to play "Stump Dale" every week or so with some obscure Internet search. For example, just before bow hunting season Zippy was wrestling with a vexing hunting dilemma: Should he use broad head or mechanical heads on his arrows?

While Zippy is an avid hunter who always gets his deer, I can barely string a bow, and my best chance of bagging a deer would be accidentally hitting one with my car. I knew what a broad head was but had not heard of mechanical arrowheads before he showed up on my doorstep with that, "You're my hero, please save me" look on his face.

He did try one search on his own, typing [which type of arrow is better] into his search engine window. What he got was apparently confusing and he wanted what he considers professional help.

So, I found myself faced with searching for information on a subject with which I have no personal experience. I find this typical of many Internet searches because we often search for information we do not already know. The trick with searching the Internet is to remember that index searching is not a technical exercise, but a semantic one.

Semantics is a discipline within the field of linguistics devoted to the study of the meaning of words, phrases and sentences. Definitions are to semantics as squares are to cubes. For example, soccer ball, ball four and Cinderella went to the ball all have different meanings for the word ball that depend on its context in relation to the surrounding words.

Zippy had the same problem with the word "arrow" because it may mean something shot from a bow or keys on a computer keyboard. If you want a relevant response from an Internet search engine, context is everything.

Let's look at the thought process behind constructing a semantically and contextually relevant search for a comparison between broad head and mechanical arrowheads for bow hunting. If you want to pull up your Web browser, open Google (the search engine I used) and follow along. Given the lag time between when I write this article — and when you read it — your results may vary.

First, let's isolate the key terms: compare, broad head, mechanical, hunting. If you put these four terms into Google and search, most of the links that come back on the first two pages will be for various commercial sites selling hunting equipment, I also found a 1999 survey of North Dakota deer hunters, but we can do better.

For the second search, we will go outside our four key terms and try the following: [broad head versus mechanical]. This returns some fairly relevant results because these terms establish a context within which the search engine can work. Google is also smart enough to find sites that use "vs." instead of versus and the term "broad head" is specific enough to archery to get good results.

There is one last refinement we can add: the word "better." Add that fourth term to the search and the results become slightly more specific because now the search engine is looking for comparisons that come to a conclusion or at least talk about relative merits.

You can also try searching on [broad head mechanical better] and get many of the same results as our previous three-word search, but you will get more advertisements for hunting gear because better shows up in advertising more than versus. Choice of terms can make a difference.

However, despite solving Zippy's search conundrum, what we found did not conclusively answer his question about which arrowhead to use. The experts who posted their test results and opinions still basically left the final decision up to the reader. The lesson here is that even though you may learn how to search for relevant
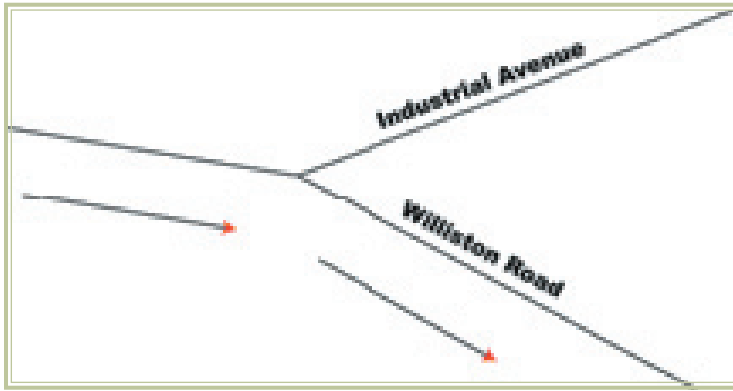
Figure 1.

results you should still be prepared to critically examine what you find and make reasoned decisions. Information, no matter how detailed, does not become knowledge until you apply it and assess the results.

Phraseology

To give you an idea just how specific information on the Internet can be, search for the right-turn-on-red rule for eastbound traffic at the intersection of Williston Road (also part of U.S. Route 2) and Industrial Avenue in South Burlington, Vt. There is a traffic light at the Industrial Avenue intersection which forms a Y junction (see Figure 1).

When the light at this intersection is green for eastbound Route 2 traffic, it is red for westbound, which means the right-of-way belongs to Industrial Avenue, not the highway. So the basic question is: Can you make a right-turn-on-red at this or any other Y-junction? Internet searching does not get much more specific than that.

First, we will try the obvious: [right turn red Y intersection], but without much luck. The second result included rules for T-junctions, with no discussion of Y. The rest of the links on the first page were directions of some type that included references to Y intersections.

Is there a way to get the search engine to filter out those results? Yes, there is. The first advanced technique we will look at is entering a search that looks for all our terms minus pages that include the word directions. It looks like this: [right turn red Y intersection -directions]. Putting a minus sign in front of a word in a search engine will tell it not to include results that include that word. Now page one still includes some links to directions, but it also now includes a link to a *Burlington Free Press* article about that intersection.

However, there is a faster way to get there. If I search on [right turn red williston road industrial avenue] the search results now return that same article at the top of the page.

The lesson here is that you will get more accurate results from specific queries than you will from generic ones. Sometimes it takes three words; sometimes it takes eight or nine. But, as with our first example, it is all about finding the right combination of terms in the correct context.

There are a host of other operators that you can use for complex searches, but the only two I have found much use for are the minus sign we used in the last example and quotation marks.

Putting quotes around a phrase tells a search engine, at least those using Boolean logic, to search for the enclosed words as a group and in a specific order.

Quotation marks are useful if you are looking for a specific document that contains a specific piece of text. If you type ["rats' feet over broken glass"] into Google as a search most of the links should take you to something about T.S. Elliot's 1925 poem, "The Hollow Men." The results without the quotation marks are not nearly as accurate.

The phrase search technique also works fairly well for finding song lyrics, speeches that contain famous quotes, and college professors trying to find if a student has simply copied something from the Internet for a paper without properly citing it. Sometimes, though, using quotes does not actually improve the search results. When I tried the same search with and without quotes in Yahoo's search engine, the results without the quotes actually were better. But because technology evolves almost daily in this area your mileage may vary.

There are a variety of other types of advanced search filters. Using Google as an example, you can filter your search results based on:

• All of the words
• An exact phrase using quotation marks
• Finding at least one of the words
• Excluding pages with particular words using a minus sign
• The language used – any of 35 different languages
• File format – any format, such as .pdf, .doc, .xls, .rtf …
• A Web page's latest update
• Numeric range – numbers between _ and _
• Where terms occur – title of the page, text, URL, links
• Domain

However, my experience has been that other than the rare need to exclude a term or find a phrase I have never needed any of the filters listed above to find what I was looking for. They are amazing displays of implementing technology — but for most of us — they are just the search engine developer showing off.

Closing Words

The search methods we reviewed should work as well for finding information on radio frequency management and federal procurement policy as they did for arrowheads and traffic regulations. Just remember the three basic concepts: understand the context of your search terms, be specific, and keep it simple. We should incorporate this technology into our own Web sites.

Knowledge may be power, but only if you can find the knowledge that you need. What Google and Yahoo can do with 20 billion pages, we should be able to do with our information repositories too.

Until next time, Happy Networking!

Long is a retired Air Force communications officer who has written regularly for CHIPS since 1993. He holds a Master of Science degree in Information Resource Management from the Air Force Institute of Technology. He is currently serving as a telecommunications manager in the U.S. Department of Homeland Security.

CHIPS

Enterprise Software Agreements Listed Below

The **Enterprise Software Initiative (ESI)** is a Department of Defense (DoD) initiative to streamline the acquisition process and provide best-priced, standards-compliant information technology (IT). The ESI is a business discipline used to coordinate multiple IT investments and leverage the buying power of the government for commercial IT products and services. By consolidating IT requirements and negotiating Enterprise Agreements with software vendors, the DoD realizes significant Total Cost of Ownership (TCO) savings in IT acquisition and maintenance. The goal is to develop and implement a process to identify, acquire, distribute and manage IT from the enterprise level.

Additionally, the ESI was incorporated into the Defense Federal Acquisition Regulation Supplement (DFARS) Section 208.74 on Oct. 25, 2002, and DoD Instruction 500.2 in May 2003.

Unless otherwise stated authorized ESI users include all DoD components, and their employees including Reserve component (Guard and Reserve) and the U.S. Coast Guard mobilized or attached to DoD; other government employees assigned to and working with DoD; nonappropriated funds instrumentalities such as NAFI employees; Intelligence Community (IC) covered organizations to include all DoD Intel System member organizations and employees, but not the CIA nor other IC employees unless they are assigned to and working with DoD organizations; DoD contractors authorized in accordance with the FAR; and authorized Foreign Military Sales.

For more information on the ESI or to obtain product information, visit the ESI Web site at http://www.esi.mil/.

Software Categories for ESI:

Business and Modeling Tools

BPWin/ERWin

BPWin/ERWin - Provides products, upgrades and warranty for ERWin, a data modeling solution that creates and maintains databases, data warehouses and enterprise data resource models. It also provides BPWin, a modeling tool used to analyze, document and improve complex business processes.

Contractor: *Computer Associates International, Inc.* (W91QUZ-04-A-0002)
Ordering Expires: Upon depletion of Army Small Computer Program (ASCP) inventory
Web Link: https://ascp.monmouth.army.mil/scp/contracts/compactview.jsp

Business Intelligence

Business Objects

Business Objects - Provides software licenses and support for Business Objects, Crystal Reports, Crystal Enterprise and training and professional services. Volume discounts range from 5 to 20 percent for purchases of software licenses under a single delivery order.
Contractor: *EC America, Inc.* (SP4700-05-A-0003)
Ordering Expires: 04 May 10
Web Link: http://www.gsaweblink.com/esi-dod/boa/

Mercury

Mercury Software - Provides software licenses, training, technical support and maintenance for Mercury Performance Center, Mercury Quality Center, Mercury IT Governance Center and Mercury Availability Center.

Contractor: *Spectrum Systems, Inc.* (SP4700-05-A-0002)
Ordering Expires: 21 Feb 09
Web Link: http://www.spectrum-systems.com/contracts-ESI.htm

Collaborative Tools

Envoke Software (CESM-E)

Envoke Software - A collaboration integration platform that provides global awareness and secure instant messaging, integration and interoperability between disparate collaboration applications in support of the DoD's Enterprise Collaboration Initiatives.

Contractor: *Structure Wise* (DABL01-03-A-1007)
Ordering Expires: 17 Dec 06
Web Link: https://ascp.monmouth.army.mil/scp/contracts/compactview.jsp

Database Management Tools

Microsoft Products

Microsoft Database Products - See information under Office Systems on page 57.

Oracle (DEAL-O)

Oracle Products - Provides Oracle database and application software licenses, support, training and consulting services. The Navy Enterprise License Agreement is for database licenses for Navy customers. Contact Navy project managers on the next page for further details.
Contractors:
Oracle Corp. (DAAB15-99-A-1002)
DLT Solutions (W91QUZ-06-A-0002)
Mythics, Inc. (W91QUZ-06-A-0003)
Ordering Expires:
Oracle: 31 Oct 06 (Call for extension information)
DLT: 18 Dec 06
Mythics: 31 Mar 07
Authorized Users: This has been designated as a DoD ESI and GSA SmartBUY contract and is open for ordering by all U.S. federal agencies, DoD components and authorized contractors.
Web Link: https://ascp.monmouth.army.mil/scp/contracts/compactview.jsp

Special Note to Navy Users: On Oct. 1, 2004, and May 6, 2005, the Navy established the Oracle Database Enterprise License, effective through Sept. 30, 2013. The enterprise license provides Navy shore-based and afloat users to include active duty, Reserve and civilian billets, as well as contractors who access Navy systems, the right to use Oracle databases for the purpose of supporting Navy internal operations. Navy users in joint commands or supporting joint functions should contact the NAVICP Mechanicsburg contracting officer at (717) 605-3210 for further review of the requirements and coverage.

This license is managed by the Space and Naval Warfare Systems Center (SPAWARSYS-CEN) San Diego DON Information Technology (IT) Umbrella Program Office.

The Navy Oracle Database Enterprise License provides significant benefits including substantial cost avoidance for the Department. It facilitates the goal of net-centric operations by allowing authorized users to access Oracle databases for Navy internal operations and permits sharing of authoritative data across the Navy enterprise.

Programs and activities covered by this license agreement shall not enter into separate Oracle database licenses outside this central agreement whenever Oracle is selected as the database. This prohibition includes software and software maintenance that is acquired:

a. as part of a system or system upgrade, including Application Specific Full Use (ASFU) licenses;
b. under a service contract;
c. under a contract or agreement administered by another agency, such as an inter-agency agreement;
d. under a Federal Supply Service (FSS) Schedule contract or blanket purchase agreement established in accordance with FAR 8.404(b)(4); or
e. by a contractor that is authorized to order from a Government supply source pursuant to FAR 51.101.

This policy has been coordinated with the Office of the Assistant Secretary of the Navy (Financial Management and Comptroller), Office of Budget.

Web Link: http://www.it-umbrella.navy.mil/contract/enterprise/deal/Oracle/oracle.shtml

Sybase (DEAL-S)

Sybase Products - Offers a full suite of software solutions designed to assist customers in achieving Information Liquidity. These solutions are focused on data management and integration; application integration; Anywhere integration; and vertical process integration, development and management. Specific products include but are not limited to: Sybase's Enterprise Application Server; Mobile and Embedded databases; m-Business Studio; HIPAA (Health Insurance Portability and Accountability Act) and Patriot Act Compliance; PowerBuilder; and a wide range of application adaptors. In addition, a Golden Disk for the Adaptive Server Enterprise (ASE) product is part of the agreement. The Enterprise portion of the BPA offers NT servers, NT seats, Unix servers, Unix seats, Linux servers and Linux seats. Software purchased under this BPA has a perpetual software license. The BPA also has exceptional pricing for other Sybase options. The savings to the government is 64 percent off GSA prices.

Contractor: *Sybase, Inc.* (DAAB15-99-A-1003); (800) 879-2273; (301) 896-1661
Ordering Expires: 15 Jan 08
Authorized Users: Authorized users include personnel and employees of the DoD, Reserve components (Guard and Reserve), U.S. Coast Guard when mobilized with, or attached to the DoD and nonappropriated funds instrumentalities. Also included are Intelligence Communities, including all DoD Intel Information Systems (DoDIIS) member organizations and employees. Contractors of the DoD may use this agreement to license software for performance of work on DoD projects.

Web Link: https://ascp.monmouth.army.mil/scp/contracts/compactview.jsp

Enterprise Architecture Tools

IBM Software Products

IBM Software Products - Provides IBM product licenses and maintenance with discounts from 1 to 19 percent off GSA. On June 28, 2006, the IBM Rational Blanket Purchase Agreement (BPA) with immixTechnology was modified to include licenses and Passport Advantage maintenance for IBM products including IBM Rational, IBM Database 2 (DB2), IBM Informix, IBM Trivoli, IBM Websphere and Lotus software products.

Contractor: *immixTechnology* (DABL01-03-A-1006); Small Business; (800) 433-5444
Ordering Expires: 26 Mar 09
Web Link: https://ascp.monmouth.army.mil/scp/contracts/compactview.jsp

Enterprise Management

CA Enterprise Management Software (C-EMS2)

Computer Associates Unicenter Enterprise Management Software - Includes Security Management; Network Management; Event Management; Output Management; Storage Management; Performance Management; Problem Management; Software Delivery; and Asset Management. In addition to these products there are many optional products, services and training available.

Contractor: *Computer Associates International, Inc.*
(W91QUZ-04-A-0002); (800) 645-3042
Ordering Expires: Effective for term of the GSA FSS Schedule
Web Link: https://ascp.monmouth.army.mil/scp/contracts/compactview.jsp

Citrix

Citrix - Provides a full range of Metaframe products including Secure Access Manager, Conferencing Manager, Password Manager, Access Suite & XP Presentation Server. Discounts range from 2 to 5 percent off GSA Schedule pricing plus spot discounts for volume purchases.
Contractor: *Citrix Systems, Inc.* (W91QUZ-04-A-0001); (772) 221-8606
Ordering Expires: 23 Feb 08
Web Link: https://ascp.monmouth.army.mil/scp/contracts/compactview.jsp

Microsoft Premier Support Services (MPS-1)

Microsoft Premier Support Services - Provides premier support packages to small and large-size organizations. The products include Technical Account Managers, Alliance Support Teams, Reactive Incidents, on-site support, Technet and MSDN subscriptions.

Contractor: *Microsoft* (DAAB15-02-D-1002); (980) 776-8283
Ordering Expires: 30 Jun 07
Web Link: https://ascp.monmouth.army.mil/scp/contracts/compactview.jsp

NetIQ

NetIQ - Provides Net IQ systems management security management and Web analytics solutions. Products include: AppManager; AppAnalyzer; Mail Marshal; Web Marshal; Vivinet voice and video products; and Vigilant Security and Management products. Discounts are 10 to 8 percent off GSA Schedule pricing for products and 5 percent off GSA Schedule pricing for maintenance.

Contractors:
NetIQ Corp. (W91QUZ-04-A-0003)
Northrop Grumman - authorized reseller
Federal Technology Solutions, Inc. - authorized reseller
Ordering Expires: 5 May 09
Web Link: https://ascp.monmouth.army.mil/scp/contracts/compactview.jsp

ProSight

ProSight - Provides software licenses, maintenance, training and installation services for enterprise portfolio management software. The software product provides the enterprise with a suite of solution specific applications for Capital Planning and Investment Control (CPIC) Budgeting (OMB 300/53); CPIC Process (Select/Control/Evaluate); IT Governance; FISMA (Federal Information Security Management Act) and Privacy Compliance; Project Portfolio Management; Application Rationalization; Research and Development (R&D) and Product Development; Asset Management; Grants Management; Vendor and Service Level Agreement Management; and Regulatory Compliance. ProSight products have been designated as a DoD ESI and GSA SmartBUY. The BPA award has been determined to be the best value to the government and; therefore, competition is not required for software purchases. Discount range for software is from 8 to 39 percent off GSA pricing, which is inclusive of software accumulation discounts. For maintenance, training and installation services, discount range is 3 to 10 percent off GSA pricing. Credit card orders are accepted.

Contractor: *ProSight, Inc.* (W91QUZ-05-A-0014); (503) 889-4813
Ordering Expires: 19 Sep 06 (Call for extension information)
Web Link: https://ascp.monmouth.army.mil/scp/contracts/compactview.jsp

Quest Products

Quest Products - Provides Quest software licenses, maintenance, services and training for Active Directory Products, enterprise management, ERP planning support and application and database support. Quest software products have been designated as a DoD ESI and GSA SmartBUY. Active Directory Products only have been determined to be the best value to the government and; therefore, competition is not required for Active Directory software purchases. Discount range for software is from 3 to 48 percent off GSA pricing. For maintenance, services and training, discount range is 3 to 8 percent off GSA pricing.
Contractors:
Quest Software, Inc. (W91QUZ-05-A-0023); (301) 820-4800
DLT Solutions (W91QUZ-06-A-0004); (703) 709-7172
Ordering Expires: 14 Aug 10
Web Link: https://ascp.monmouth.army.mil/scp/contracts/viewcontract.jsp?cNum=W91QUZ-05-A-0023

Telelogic Products

Telelogic Products - Offers development tools and solutions which assist the user in automation in the development life cycle. The major products include DOORS, SYNERGY and TAU Generation. Licenses, maintenance, training and services are available.

Contractors:
Bay State Computers, Inc. (N00104-04-A-ZF13); Small Business Disadvantaged; (301) 352-7878, ext. 116
Spectrum Systems, Inc. (N00104-06-A-ZF31); Small Business ; (703) 591-7400
Ordering Expires: 29 Jun 07
Web Link: http://www.it-umbrella.navy.mil/contract/enterprise/telelogic/telelogic.shtml

Enterprise Resource Planning

Digital Systems Group

Digital Systems Group - Provides Integrated Financial Management Information System (IFMIS) software that was designed specifically as federal financial management system software for government agencies and activities. The BPA also provides installation, maintenance, training and professional services.

Contractor: *Digital Systems Group, Inc.* (N00104-04-A-ZF19); (215) 443-5178
Ordering Expires: 23 Aug 07
Web Link: http://www.it-umbrella.navy.mil/contract/enterprise/erp_software/dsg/dsg.shtml

Oracle

Oracle - *See information provided under Database Management Tools on page 53.*

RWD Technologies

RWD Technologies - Provides a broad range of integrated software products designed to improve the productivity and effectiveness of end users in complex operating environments. RWD's Info Pak products allow you to easily create, distribute and maintain professional training documents and online help for any computer application. RWD Info Pak products include Publisher, Administrator, Simulator and OmniHelp. Training and other services are also available.

Contractor: *RWD Technologies* (N00104-06-A-ZF37); (410) 869-1085
Ordering Expires: Effective for term of the GSA FSS Schedule
Web Link: http://www.it-umbrella.navy.mil/contract/enterprise/erp_software/rwd/rwd.shtml

SAP

SAP Software - Provides software license, installation, implementation technical support, maintenance and training services.
Contractor: *SAP Public Sector & Education, Inc.* (N00104-02-A-ZE77); (202) 312-3905
Ordering Expires: Effective for term of the GSA FSS Schedule
Web Link: http://www.it-umbrella.navy.mil/contract/enterprise/sap/sap.shtml

ERP Systems Integration Services

ERP Systems

ERP Systems Integration Services - Provides the procurement of configuration; integration; installation; data conversion; training; testing; object development; interface development; business process reengineering; project management; risk management; quality assurance; and other professional services for COTS software implementations. Ordering under the BPAs is decentralized and is open to all DoD activities. The BPAs offer GSA discounts from 10 to 20 percent. Firm fixed prices and performance-based contracting approaches are provided to facilitate more efficient buying of systems integration services. Five BPAs were competitively established against the GSA Schedule. Task orders must be competed among the five BPA holders in accordance with DFARS 208.404-70 and Section C.1.1 of the BPA. Acquisition strategies at the task order level should consider that Section 803 of the National Defense Authorization Act for 2002 requirements were satisfied by the BPA competition.

Contractors:
Accenture LLP (N00104-04-A-ZF12); (703) 947-2059
BearingPoint (N00104-04-A-ZF15); (703) 747-5442
Computer Sciences Corp. (N00104-04-A-ZF16); (856) 252-5583
Deloitte Consulting LLP (N00104-04-A-ZF17); (703) 885-6428
IBM Corp. (N00104-04-A-ZF18); (301) 803-6625
Ordering Expires: 03 May 09
Web Link: http://www.it-umbrella.navy.mil/contract/enterprise/erp_services/erp-esi.shtml

Information Assurance Tools

Network Associates, Inc.

Network Associates, Inc. (NAI) - This protection encompasses the following NAI products: VirusScan; Virex for Macintosh; VirusScan Thin Client; NetShield; NetShield for NetApp; ePolicy Orchestrator; VirusScan for Wireless; GroupShield; WebShield (software only for Solaris and SMTP for NT); and McAfee Desktop Firewall for home use only.

Contractor: *Network Associates, Inc.* (DCA100-02-C-4046)

Ordering Expires: Nonexpiring. Download provided at no cost; go to the Antivirus Web links below for antivirus software downloads.

Web Link: http://www.esi.mil

Antivirus Web Links: Antivirus software available for no cost download includes McAfee, Symantec and Trend Micro Products. These products can be downloaded by linking to either of the following Web sites:

> NIPRNET site: http://www.cert.mil/antivirus/av_info.htm
> SIPRNET site: http://www.cert.smil.mil/antivirus/av_info.htm

Securify

Securify - Provides policy-driven appliances for network security that are designed to validate and enforce intended use of networks and applications; protects against all risks and saves costs on network and security operations. Securify integrates application layer seven traffic analysis with signatures and vulnerability scanning in order to discover network behavior. It provides highly accurate, real-time threat mitigation for both known and unknown threats and offers true compliance tracking.

Contractor: *Patriot Technologies, Inc.*

Ordering Expires: 4 Jan 11 (if extended by option exercise)

Web Link: http://www.esi.mil

Symantec

Symantec - Provides the full line of Symantec Corp. products and services consisting of over 6,000 line items including Ghost and Brightmail. Symantec products can be divided into eight main categories that fall under the broad definition of Information Assurance. These categories are: virus protection; anti-spam; content filtering; anti-spyware solutions; intrusion protection; firewalls/VPN; integrated security; security management; vulnerability management; and policy compliance. ***Notice to DoD customers regarding Symantec Antivirus Products:*** *A DoD Enterprise License exists for select Antivirus products through DISA contract DCA100-02-C-4049 found below.*

Contractor: *immix Technology*

Ordering Expires: 12 Sep 10

Web Link: http://www.immixtechnology.com/esi/Symantec/ or http://www.esi.mil

Symantec Antivirus

Symantec - This protection encompasses the following Symantec products: Symantec Client Security; Norton Antivirus for Macintosh; Symantec System Center; Symantec AntiVirus/Filtering for Domino; Symantec AntiVirus/Filtering for MS Exchange; Symantec AntiVirus Scan Engine; Symantec AntiVirus Command Line Scanner; Symantec for Personal Electronic Devices; Symantec AntiVirus for SMTP Gateway; Symantec Web Security (AV only); and support.

Contractor: *Northrop Grumman Information Technology*
(DCA100-02-C-4049)

Ordering Expires: Nonexpiring. Download provided at no cost; go to the Antivirus Web links below for antivirus software downloads.

Web Link: http://www.esi.mil

Antivirus Web Links: Antivirus software available for no cost download includes McAfee, Symantec and Trend Micro Products. These products can be downloaded by linking to either of the following Web sites:

> NIPRNET site: http://www.cert.mil/antivirus/av_info.htm
> SIPRNET site: http://www.cert.smil.mil/antivirus/av_info.htm

Trend Micro

Trend Micro - This protection encompasses the following Trend Micro products: InterScan Virus Wall (NT/2000, Solaris, Linux); ScanMail for Exchange (NT, Exchange 2000); TMCM/TVCS (Management Console - TMCM W/OPP srv.); PC-Cillin for Wireless; and Gold Premium support contract/year (PSP), which includes six POCs.

Contractor: *Government Technology Solutions*
(DCA100-02-C-4045)

Ordering Expires: Nonexpiring. Download provided at no cost; go to the Antivirus Web links below for antivirus software downloads.

Web Link: http://www.esi.mil

Antivirus Web Links: Antivirus software available for no cost download includes McAfee, Symantec and Trend Micro Products. These products can be downloaded by linking to either of the following Web sites:

> NIPRNET site: http://www.cert.mil/antivirus/av_info.htm
> SIPRNET site: http://www.cert.smil.mil/antivirus/av_info.htm

Xacta

Xacta - Provides Web Certification and Accreditation (C&A) software products, consulting support and enterprise messaging management solutions through its Automated Message Handling System (AMHS) product. The software simplifies C&A and reduces its costs by guiding users through a step-by-step process to determine risk posture and assess system and network configuration compliance with applicable regulations, standards and industry best practices, in accordance with the DITSCAP, NIACAP, NIST or DCID processes. Xacta's AMHS provides automated, Web-based distribution and management of messaging across your enterprise.

Contractor: *Telos Corp.* (F01620-03-A-8003); (703) 724-4555

Ordering Expires: 31 Jul 08

Web Link: http://esi.telos.com/contract/overview/

Office Systems

Adobe

Adobe Products - Provides software licenses (new and upgrade) and upgrade plans (formerly known as maintenance) for numerous Adobe and formerly branded Macromedia products, including Acrobat (Standard and Professional); Photoshop; Encore; After Effects; Frame Maker; Creative Suites; Illustrator; Flash Professional; Dreamweaver; Cold Fusion and other Adobe products.

Contractors:
ASAP (N00104-06-A-ZF33); Small Business; (800) 248-2727, ext. 5303
CDW-G (N00104-06-A-ZF34); (703) 621-8211
Softchoice (N00104-06-A-ZF35); Small Business; (703) 480-1957
Softmart (N00104-06-A-ZF36); Small Business; (610) 518-4192

Ordering Expires: 31 May 08

Web Link: http://www.it-umbrella.navy.mil/contract/enterprise/adobe-esa/index.shtml

Four new Blanket Purchase Agreements (BPAs) provide both new and upgrade software licenses for Adobe products. These agreements also provide Adobe software upgrade plans, formerly known as maintenance agreements. The BPAs include software licenses formerly known under the Macromedia product brand. Products include: Acrobat (Standard and Professional); Photoshop; Encore; After Effects; Frame Maker; Creative Suites; Illustrator; Flash Professional; Dreamweaver; Cold Fusion; and other Adobe products.

The awardees are CDW-G, Softmart, ASAP and Softchoice.

A change in Adobe licensing will affect a user's ability to purchase upgrade plan coverage for legacy products. Without purchasing upgrade plan coverage, customers will not be eligible for free version upgrades.

From May 1 through Nov. 1, 2006, all Defense Department customers that own Adobe and Macromedia legacy software licenses will be able to purchase a new upgrade plan — if the customer's software licenses are at current shipping versions. The first six months of the new Adobe agreement will be the only opportunity to cover (maintain) legacy Adobe products even if customers currently have maintenance plans.

Customers that do not take advantage of this limited time offer will have to purchase an upgrade license (if available) or repurchase a new license for the Adobe product to obtain the latest Adobe versions.

After the first six-month period, upgrade plans can only be purchased for new and upgrade licenses — and only at the time of a new license purchase.

Products may be purchased through the ITEC Direct storefront (http://www.itec-direct.navy.mil). Customers can make direct purchases using the government credit card; contact software product managers and obtain customer service; browse our product line; review policy notices; and access small business contracts.

Should you have any questions, please contact the Software Program Manager at (619) 524-9640 (DSN 524); or the NAVICP contracting officer at (717) 605-2003.

We will also be posting any new information and/or guidance to our DoD ESI Web site at www.esi.mil. We appreciate your patience during this transition period and will be happy to provide any assistance you may need.

iGrafx Business Process Analysis Tools - NEW!

iGrafx - Provides software licenses, maintenance and media for iGrafx Process 2005 and 2006 for Six Sigma and iGrafx Flowcharter 2005 and 2006.

Contractors:
Softchoice (N00104-06-A-ZF40); (703) 480-1972
Softmart (N00104-06-A-ZF39); (610) 518-4192
Software House International (N00104-06-A-ZF38); (304) 725-6110
Authorized Users: Open for ordering by all Department of Defense (DoD) Components, U. S. Coast Guard, NATO, Intelligence Community and authorized DoD contractors.
Ordering Expires: 16 Jul 08
Web Links:
Softchoice
http://www.it-umbrella.navy.mil/contract/enterprise/iGrafx/softchoice/index.shtml
Softmart
http://www.it-umbrella.navy.mil/contract/enterprise/iGrafx/softmart/index.shtml
Software House International
http://www.it-umbrella.navy.mil/contract/enterprise/iGrafx/shi/index.shtml

Microsoft Products

Microsoft Products - Provides licenses and software assurance for desktop configurations, servers and other products. In addition, any Microsoft product available on the GSA Schedule can be added to the BPA.

Contractors:
ASAP (N00104-02-A-ZE78); Small Business; (800) 248-2727, ext. 5303
CDW-G (N00104-02-A-ZE85); (847) 968-9429
Dell (N00104-02-A-ZE83); (800) 727-1100 ext. 37010 or (512) 723-7010
GTSI (N00104-02-A-ZE79); Small Business; (800) 999-GTSI or (703) 463-5325
Hewlett-Packard (N00104-02-A-ZE80); (800) 535-2563 pin 6246
Softchoice (N00104-02-A-ZE81); Small Business; (877) 333-7638 or (312) 655-9167
Softmart (N00104-02-A-ZE84); (610) 518-4000, ext. 6492 or (800) 628-9091 ext. 6928
Software House International (N00104-02-A-ZE86); (732) 868-5926
Software Spectrum, Inc. (N00104-02-A-ZE82); (800) 862-8758 or (509) 742-2208
Ordering Expires: 30 Mar 07
Web Link: http://www.it-umbrella.navy.mil/contract/enterprise/microsoft/ms-ela.shtml

Red Hat

Red Hat *(Netscape software formerly owned by AOL, not Linux)* - In December 2004, America Online (AOL) sold Netscape Security Solutions Software to Red Hat. This sale included the three major software products previously provided by DISA (Defense Information Systems Agency) to the DoD and Intelligence Communities through AOL. *Note: The Netscape trademark is still owned by AOL, as are versions of Netscape Communicator above version 7.2. Netscape Communicator version 8.0 is not part of this contract.*

August Schell Enterprises is providing ongoing support and maintenance for the Red Hat Security Solutions (products formerly known as Netscape Security Solutions) which are at the core of the DoD's Public Key Infrastructure (PKI). This contract provides products and services in support of the ongoing DoD-wide enterprise site license for Red Hat products. This encompasses all components of the U.S. Department of Defense and supported organizations that use the Joint Worldwide Intelligence Communications System (JWICS), including contractors.

Licensed software products available from DISA are the commercial versions of the software, not the segmented versions that are compliant with Global Information Grid (GIG) standards. The segmented versions of the software are required for development and operation of applications associated with the GIG, the Global Command and Control System (GCCS) or the Global Combat Support System (GCSS).

If your intent is to use a licensed product available for download from the DoD Download Site to support development or operation of an application associated with the GIG, GCCS or GCSS, you must contact one of the Web sites listed below to obtain the GIG segmented version of the software. You may not use the commercial version available from the DoD Download Site.

If you are not sure which version (commercial or segmented) to use, we strongly encourage you to refer to the Web sites listed below for additional information to help you to make this determination before you obtain the software from the DoD Download Site.

GIG or GCCS users: Common Operating Environment Home Page
https://coe.mont.disa.mil
GCSS users: Global Combat Support System
http://www.disa.mil/main/prodsol/gcss.html

Contractor: *Red Hat*
Ordering Expires: 06 Mar 07
Download provided at no cost.
Web Link: http://iase.disa.mil/netlic.html

Red Hat Linux

Red Hat Linux - Provides operating system software license subscriptions and services to include installation and consulting support, client-directed engineering and software customization. Red Hat Enterprise Linux is the premier operating system for open source computing. It is sold by annual subscription, runs on seven system architectures and is certified by top enterprise software and hardware vendors.

Contractor: *DLT Solutions, Inc.* (HC1013-04-A-5000)
Ordering Expires: 30 Apr 09
Web Link: http://www.dlt.com/contracts-Redhat-BPA.asp

WinZip

WinZip - This is an IDIQ contract with Eyak Technology, LLC, an "8(a)" Small Disadvantaged Business (SDB)/Alaska Native Corp. for the purchase of WinZip 9.0, a compression utility for Windows. Minimum quantity order via delivery order and via Government Purchase Card to Eyak Technology, LLC is 1,250 WinZip licenses. All customers are entitled to free upgrades and maintenance for a period of two years from original purchase. Discount is 98.4 percent off retail. Price per license is 45 cents.

Contractor: *Eyak Technology, LLC* (W91QUZ-04-D-0010)
Authorized Users: This has been designated as a DoD ESI and GSA SmartBUY Contract and is open for ordering by all U.S. federal agencies, DoD components and authorized contractors.
Ordering Expires: 27 Sep 09
Web Link: https://ascp.monmouth.army.mil/scp/contracts/compactview.jsp

Operating Systems

Novell

Novell Products - Provides master license agreement for all Novell products, including NetWare, GroupWise and ZenWorks.

Contractor: *ASAP Software* (N00039-98-A-9002); Small business; (800) 883-7413
Ordering Expires: 31 Mar 07
Web Link:
http://www.it-umbrella.navy.mil/contract/enterprise/novell/novell.shtml

Sun (SSTEW)

SUN Support - Sun Support Total Enterprise Warranty (SSTEW) offers extended warranty, maintenance, education and professional services for all Sun Microsystems products. The maintenance covered in this contract includes flexible and comprehensive hardware and software support ranging from basic to mission critical services. Maintenance covered includes Sun Spectrum Platinum, Gold, Silver, Bronze, hardware only and software only support programs.

Contractor: *Dynamic Systems* (DCA200-02-A-5011)
Ordering Expires: Dependent on GSA Schedule until 2011
Web Link: http://www.ditco.disa.mil/hq/contracts/sstewchar.asp

Research and Advisory BPAs
Listed Below

Research and Advisory Services BPAs provide unlimited access to telephone inquiry support, access to research via Web sites and analyst support for the number of users registered. In addition, the services provide independent advice on tactical and strategic IT decisions. Advisory services provide expert advice on a broad range of technical topics and specifically focus on industry and market trends. BPA listed below.

Gartner Group (N00104-03-A-ZE77); (703) 226-4815; Awarded Nov 02; one-year base period with three one-year options.
Ordering Expires: 27 Nov 06 (Renewal is Pending)
Authorized Users: All DoD components and their employees, including Reserve Components (Guard and Reserve); the U.S. Coast Guard; other government employees assigned to and working with DoD; nonappropriated funds instrumentalities of the DoD; DoD contractors authorized in accordance with the FAR and authorized Foreign Military Sales.
Web Link: http://www.it-umbrella.navy.mil/contract/r&a/gartner/gartner.shtml

Records Management
TOWER Software

TOWER Software - Provides TRIM Context software products, maintenance, training and services. TRIM Context is an integrated electronic document and records management platform for Enterprise Content Management that securely manages business information in a single repository through its complete life cycle. The TOWER TRIM solution provides: document management; records management; workflow management; Web-based records management; document content indexing; e-mail management; and imaging. The DoD Enterprise Software Initiative (ESI) Enterprise Software Agreement (ESA) provides discounts of 10 to 40 percent off GSA for TRIM Context software licenses and maintenance and 5 percent off GSA for training and services.

Contractor: *TOWER Software Corporation* (FA8771-06-A-0302)
Ordering Expires: 17 Feb 08 (5 Dec 10 if extended by option exercise)
Web link: http://www.esi.mil

Section 508 Tools

HiSoftware 508 Tools

HiSoftware Section 508 Web Developer Correction Tools - Includes AccRepair (StandAlone Edition), AccRepair for Microsoft FrontPage, AccVerify for Microsoft FrontPage and AccVerify Server. Also includes consulting and training support services.

Contractor: *HiSoftware, DLT Solutions, Inc.* (N00104-01-A-Q570); Small Business; (888) 223-7083 or (703) 773-1194
Ordering Expires: 15 Aug 07
Web Link: http://www.it-umbrella.navy.mil/contract/508/dlt/dlt.shtml
Warranty: IAW GSA Schedule. Additional warranty and maintenance options available. Acquisition, Contracting and Technical fee included in all BLINS.

ViViD Contracts
N68939-97-D-0040
Contractor: General Dynamics
N68939-97-D-0041
Contractor: General Dynamics

ViViD provides digital switching systems, cable plant components, communications and telecommunications equipment and services required to engineer, maintain, operate and modernize base level and ships afloat information infrastructure. This includes pier-side connectivity and afloat infrastructure with purchase, lease and lease-to-own options. Outsourcing is also available. Awarded to:

Avaya Incorporated (N68939-97-D-0040); (888) VIVID4U or (888) 848-4348. Avaya also provides local access and local usage services
General Dynamics (N68939-97-D-0041); (888) 483-8831
Modifications: Latest contract modifications are available at http://www.it-umbrella.navy.mil
Ordering Expires:
Contract ordering for all new equipment purchases has expired. All Labor CLINS, Support Services and Spare Parts can still be ordered through 28 Jul 07.
Authorized users: DoD and U.S. Coast Guard
Warranty: Four years after government acceptance. Exceptions are original equipment manufacturer (OEM) warranties on catalog items.
Acquisition, Contracting & Technical Fee: Included in all CLINS/SCLINS
Direct Ordering to Contractor
Web Link: http://www.it-umbrella.navy.mil/contract/vivid/vivid.shtml

TAC Solutions BPAs
Listed Below

TAC Solutions provides PCs, notebooks, workstations, servers, networking equipment and all related equipment and services necessary to provide a completely integrated solution. BPAs have been awarded to the following:

Dell (N68939-97-A-0011); (800) 727-1100, ext. 7233795
GTSI (N68939-96-A-0006); (800) 999-4874, ext. 2104
Hewlett-Packard (N68939-96-A-0005); (800) 727-5472, ext. 15614
Ordering Expires:
Dell: 31 Mar 07 (Call for extension information)
GTSI: 31 Mar 07 (Call for extension information)
Hewlett-Packard: 07 May 07 (Call for extension information)
Authorized Users: DON, U.S. Coast Guard, DoD and other federal agencies with prior approval.
Warranty: IAW GSA Schedule. Additional warranty options available.

Department of the Navy Enterprise Solutions BPA

Navy Contract: N68939-97-A-0008

The Department of the Navy Enterprise Solutions (DON ES) BPA provides a wide range of technical services, specially structured to meet tactical requirements, including worldwide logistical support, integration and engineering services (including rugged solutions), hardware, software and network communications solutions. DON ES has one BPA.

Computer Sciences Corp. (N68939-97-A-0008); (619) 225-2600; Awarded 7 May 97

Ordering Expires: 31 Mar 07 (Call for extension information)

Authorized Users: All DoD, federal agencies and U.S. Coast Guard.

Web Link: http://www.it-umbrella.navy.mil/contract/don-es/csc.shtml

Information Technology Support Services BPAs

Listed Below

The Information Technology Support Services (ITSS) BPAs provide a wide range of IT support services such as networks, Web development, communications, training, systems engineering, integration, consultant services, programming, analysis and planning. ITSS has four BPAs. They have been awarded to:

Centurum Information Technology, Inc. (Small Business) (N00039-98-A-3008); (619) 224-1100; Awarded 15 Jul 98

Lockheed Martin (N68939-97-A-0017); (240) 725-5074; Awarded 1 Jul 97

Northrop Grumman Information Technology
(N68939-97-A-0018); (703) 413-1084; Awarded 1 Jul 97

SAIC (N68939-97-A-0020); (703) 676-2388; Awarded 1 Jul 97

Ordering Expires:
Centurum: 14 Jul 07 (Call for extension information)
Lockheed Martin: 30 Jun 07 (Call for extension information)
Northrop Grumman IT: 11 Feb 07 (Call for extension information)
SAIC: 30 Jun 07 (Call for extension information)

Authorized Users: All DoD, federal agencies and U.S. Coast Guard

Web Links:
Centurum
http://www.it-umbrella.navy.mil/contract/itss/centurum/itss-centurum.shtml

Lockheed Martin
http://www.it-umbrella.navy.mil/contract/itss/lockheed/itss-lockheed.shtml

Northrop Grumman IT
http://www.it-umbrella.navy.mil/contract/itss/northrop/itss-northrop.shtml

SAIC
http://www.it-umbrella.navy.mil/contract/itss/saic/itss-saic.shtm

The DON IT Umbrella Program Team offers great customer service!

Visit us on the Web

DON IT Umbrella site:

www.it-umbrella.navy.mil

ITEC Direct e-Commerce site:

www.itec-direct.navy.mil

DoD Enterprise Software Initiative:

www.esi.mil

DON IT umbrella program

Please join us for the Department of the Navy IM and IT Conference

30 January - 2 February 2007
San Diego Convention Center, San Diego, CA

Hosted by the Department of the Navy Chief Information Officer (DON CIO)

The DON IM and IT Conference provides a venue to share information about the latest DON IM and IT initiatives, policy and guidance. Conference topics include:

Certification & Accreditation	Knowledge Management in the Fleet
Cryptographic Logon	Managing the Radio Frequency Spectrum
Data Management	Managing Telecommunications Service
DITSCAP/DIACAP	Ordering SW via DON IT Umbrella Program
DON IM/IT Civilian Workforce	Privacy
Enterprise Architecture	Remote Access
Enterprise Software/IT Asset Management	Service Oriented Architecture
FISMA	Systems Integration Services
Identity Management	Telework
Information Assurance	Wireless
IT Performance Measurement	

Feedback from attendees at the May 2006 DON IM and IT Conference in Hampton, VA indicated that the conference was valuable and attendees would recommend it to their colleagues.

The DON IM and IT Conference will be open to all DON, government, and support contractor attendees. No conference fee will be assessed, but registration is required. Register at http://customer.bcinow.com/donregistration.

The agenda for the DON IM and IT sessions is available on the DON CIO web site at http://www.doncio.navy.mil. For additional information call (703) 602-6274.